Über dieses Buch

Dies ist ein digitales Exemplar eines Buches, das seit Generationen in den Regalen der Bibliotheken aufbewahrt wurde, bevor es von Google im Rahmen eines Projekts, mit dem die Bücher dieser Welt online verfügbar gemacht werden sollen, sorgfältig gescannt wurde.

Das Buch hat das Urheberrecht überdauert und kann nun öffentlich zugänglich gemacht werden. Ein öffentlich zugängliches Buch ist ein Buch, das niemals Urheberrechten unterlag oder bei dem die Schutzfrist des Urheberrechts abgelaufen ist. Ob ein Buch öffentlich zugänglich ist, kann von Land zu Land unterschiedlich sein. Öffentlich zugängliche Bücher sind unser Tor zur Vergangenheit und stellen ein geschichtliches, kulturelles und wissenschaftliches Vermögen dar, das häufig nur schwierig zu entdecken ist.

Gebrauchsspuren, Anmerkungen und andere Randbemerkungen, die im Originalband enthalten sind, finden sich auch in dieser Datei – eine Erinnerung an die lange Reise, die das Buch vom Verleger zu einer Bibliothek und weiter zu Ihnen hinter sich gebracht hat.

Nutzungsrichtlinien

Google ist stolz, mit Bibliotheken in partnerschaftlicher Zusammenarbeit öffentlich zugängliches Material zu digitalisieren und einer breiten Masse zugänglich zu machen. Öffentlich zugängliche Bücher gehören der Öffentlichkeit, und wir sind nur ihre Hüter. Nichtsdestotrotz ist diese Arbeit kostspielig. Um diese Ressource weiterhin zur Verfügung stellen zu können, haben wir Schritte unternommen, um den Missbrauch durch kommerzielle Parteien zu verhindern. Dazu gehören technische Einschränkungen für automatisierte Abfragen.

Wir bitten Sie um Einhaltung folgender Richtlinien:

+ *Nutzung der Dateien zu nichtkommerziellen Zwecken* Wir haben Google Buchsuche für Endanwender konzipiert und möchten, dass Sie diese Dateien nur für persönliche, nichtkommerzielle Zwecke verwenden.
+ *Keine automatisierten Abfragen* Senden Sie keine automatisierten Abfragen irgendwelcher Art an das Google-System. Wenn Sie Recherchen über maschinelle Übersetzung, optische Zeichenerkennung oder andere Bereiche durchführen, in denen der Zugang zu Text in großen Mengen nützlich ist, wenden Sie sich bitte an uns. Wir fördern die Nutzung des öffentlich zugänglichen Materials für diese Zwecke und können Ihnen unter Umständen helfen.
+ *Beibehaltung von Google-Markenelementen* Das "Wasserzeichen" von Google, das Sie in jeder Datei finden, ist wichtig zur Information über dieses Projekt und hilft den Anwendern weiteres Material über Google Buchsuche zu finden. Bitte entfernen Sie das Wasserzeichen nicht.
+ *Bewegen Sie sich innerhalb der Legalität* Unabhängig von Ihrem Verwendungszweck müssen Sie sich Ihrer Verantwortung bewusst sein, sicherzustellen, dass Ihre Nutzung legal ist. Gehen Sie nicht davon aus, dass ein Buch, das nach unserem Dafürhalten für Nutzer in den USA öffentlich zugänglich ist, auch für Nutzer in anderen Ländern öffentlich zugänglich ist. Ob ein Buch noch dem Urheberrecht unterliegt, ist von Land zu Land verschieden. Wir können keine Beratung leisten, ob eine bestimmte Nutzung eines bestimmten Buches gesetzlich zulässig ist. Gehen Sie nicht davon aus, dass das Erscheinen eines Buchs in Google Buchsuche bedeutet, dass es in jeder Form und überall auf der Welt verwendet werden kann. Eine Urheberrechtsverletzung kann schwerwiegende Folgen haben.

Über Google Buchsuche

Das Ziel von Google besteht darin, die weltweiten Informationen zu organisieren und allgemein nutzbar und zugänglich zu machen. Google Buchsuche hilft Lesern dabei, die Bücher dieser Welt zu entdecken, und unterstützt Autoren und Verleger dabei, neue Zielgruppen zu erreichen. Den gesamten Buchtext können Sie im Internet unter `http://books.google.com` durchsuchen.

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

https://books.google.com

NYPL RESEARCH LIBRARIES
3 3433 00772150 3

ELECTRIC

TPB
+

AP 6 '25

McGraw-Hill Co., Inc. April 4, 1925 Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL

G.L.P.& T. decl. in first quarter of year

V 65 Apr- June 1925

Samson Spot
Trolley Cord
good for many a trouble free run!

Samson
Bell and Register
Cord

Samson Trade Mark

A firmly braided yet supple cord, made from extra quality stock with a uniformly smooth finish, and thoroughly waterproofed.

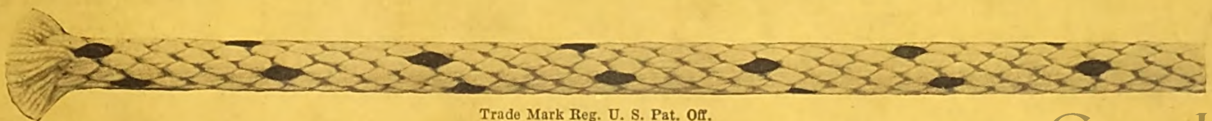
The kind of cord that neither kinks nor swells; the kind that feeds in and out of the catcher freely and easily; and the kind that will banish, for all time, trolley and catcher troubles arising from poor quality cord.

Look for the colored spots, our trade mark.

Samson Bell and Register Cord is the same extra quality as Samson Spot Trolley Cord. Made in drab, mahogany and white; with wire center if so desired.

SAMSON CORDAGE WORKS
88 Broad Street, Boston, Mass.

p.d.

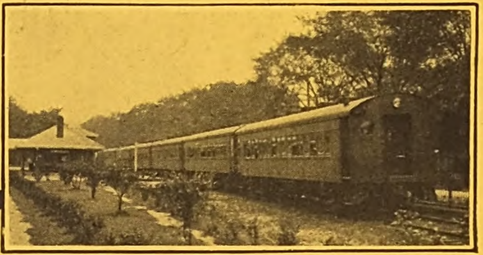


Trade Mark Reg. U. S. Pat. Off.

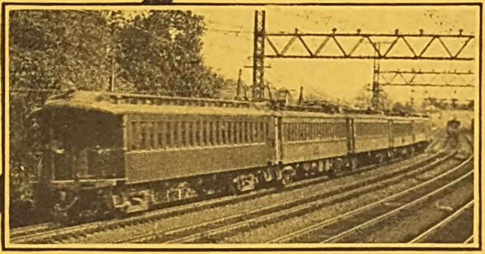
Solving the Suburban Problem

Pennsylvania R. R. Multiple-Unit Train

WESTINGHOUSE ELECTRIC



Long Island R. R. Multiple-Unit Train



New York, New Haven & Hartford R. R.
Multiple-Unit Train

New York, Westchester & Boston Ry.
Multiple-Unit Train

THE Pennsylvania, the Long Island, the New York, New Haven & Hartford and the New York, Westchester & Boston are among the steam railroads that have successfully solved their suburban problems in their most congested areas by means of High-Speed, Electric Multiple-Unit Trains.

The introduction of Multiple Unit Trains has carried with it improved suburban service with cleaner trains, maintaining faster schedules; also, relief from terminal congestion with a corresponding increase in track efficiency due to the reduction in train movements; and increased value of real estate along the right of way because of absence of smoke and cinders.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Westinghouse

X 79750

PUBLIC LIBRARY
208896A
ASTOR, LENOX AND
TILDEN FOUNDATIONS
R 1925 L

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, April 4, 1925 *Number* 14

The New Era Begins for the American Association

A RED-LETTER day in the annals of the American Electric Railway Association is April 2, 1925, for on that day the new managing director, Lucius S. Storrs, formally took office. Coming as he does from a large property where he has made an enviable record, he has an excellent background to work on. Many problems await him. Financing electric railways deserves close attention. Securing better public relations, and telling the railway men how to present their side of the picture, is another problem. The adoption of the latest transportation tool, the bus, helping to see it in its true perspective and give it the proper place as an integral part of co-ordinated transportation service, is still another problem—and one of major proportions. Right now the industry is confronted with the need for regulation of interstate motor traffic, which has been thrown into chaos as a result of the recent decision of the United States Supreme Court. These are just a few of the things that will demand earnest attention from Mr. Storrs.

To obtain best results too much help cannot be given the new managing director. It is only by teamwork that he will be able to accomplish maximum results. While his services will be available to every railway in the country, as well as to the public, the railways and the public can well afford to make their services available to him. The ELECTRIC RAILWAY JOURNAL pledges its full support to Mr. Storrs, and at the outset wishes him and the association the greatest of success in the new undertaking.

Everything Points to the Best Convention Ever

PREPARATIONS for the annual convention of the American Association are now well under way. Arrangements have been made on substantially the same terms as last year for the use of the facilities at Atlantic City. Nothing is in the way of bettering the performance. The space available for exhibits is limited to some 90,000 sq.ft., hence to get the most out of it every bit must be made to count.

One thing that will make the exhibits more valuable is the display of products that have been in service. A railway man likes to see the latest developments, it is true. Even more is he interested in things that have been weighed in the balance and not found wanting. In the past the exhibits that have attracted the most attention from operators have been those that showed what the part looked like after it had been used for all or a considerable portion of its natural life.

An innovation this year is the construction of a temporary track that will permit exhibitors to transport complete cars to and from the pier and vicinity with less labor than in past years and at a cost that is not prohibitive. Not only should manufacturers seize the opportunity, but operating companies should be willing to give others the benefit of their experience by the exhibition of cars that have proved successful in service. Taken off the street, they should make apparent the value of the best practices in a way better than new equipment can do.

So let every one plan to show the best he has, and make it an exhibit that will be far and away in advance of anything ever before attempted by the association.

Boston Made a Good Bargain

NINE years ago the Boston Elevated Railway was on the verge of bankruptcy. The story is familiar to all who have followed traction history. Costs mounted along with the war, but as in many other cities fares were held down to the then universal 5 cents. The consulting engineer who made a report on the finances of the company found that there was an actual deficit resulting from the operations, including only a low rate of interest on the investment. As the property was being allowed to depreciate without proper allowance for renewals, the actual loss was still greater, the total cost being 20 per cent greater than the revenue. Evidently the road was headed for a receivership. As the city of Boston was interested financially, having spent large sums on subways, it felt that its investment should be protected. Yet the city officials were unwilling to give the company the financial relief it needed to carry on.

The solution adopted was that the State of Massachusetts became sponsor for the finances of the property. Though the company continued as a private corporation, the state assumed control. For the past nine years the road has been operated by a board of public trustees. The management has been progressive and far-seeing. Fares at Boston have been increased according to a formula automatic in its operation which could not be misinterpreted. Service was improved, maintenance was taken care of, and obsolete and discarded property written off the books. While there was a deficit the first few years conditions have since improved, so that eventually the state will get back every dollar that has been advanced to make good the loss.

The excellence of the arrangement was attested by Mayor James M. Curley of Boston, speaking before the New England Street Railway Club last week. His address is published elsewhere. The city is so well pleased that now it desires to extend the contract for control of the railway system an additional twenty years. More than that, the plan is held up by the Mayor as a model that might well be copied by cities all over the United States. With such an indorsement as this, the public trustees and the men who had the vision to put the plan forward may well feel repaid for their efforts in providing the Boston district with a modern transportation system.

Better Marking Is Needed to Indicate Bus Routes

DURING a recent visit to a small town where street railway service has been entirely replaced by buses, an editor of this paper had occasion to ask how to reach one of the local bus lines. He was directed to go down the street until he reached the car tracks, where he could get a bus.

Surely this was a strange way to give directions in a town where the bus has been substituted for the trolley car. But it illustrates an inherent advantage of the railway, and shows that something yet remains to be done by the bus men in the line of improving service.

Tracks, poles, and overhead wires are visible evidence of the location of a transportation route. Moreover, the trolley poles are usually so marked that prospective passengers know where to wait for their vehicles. Where traffic is heavy, many street railways have also adopted the practice of indicating the exact stopping places by the use of signs on the span wires or at the curb. This is seldom the case with a bus route. The advantages of having the route and stop locations clearly marked certainly justify the moderate cost of such a procedure. It is a matter that deserves the careful consideration of all bus operating companies.

Valuation Practice Must Be Clarified

THREE recent valuation decisions which have followed each other in rapid succession are deeply significant to the electric railway industry. These include the decisions of the federal courts in the Denver and Duluth cases, published in the Dec. 20, 1924, and the Jan. 24, 1925, issues of ELECTRIC RAILWAY JOURNAL, respectively. The recent findings of the Minnesota Railroad and Warehouse Commission fixing the value of the street railway properties in St. Paul and Minneapolis were published in the March 14, 1925, issue.

Each of these decisions shows an increasing insight, on the part of those charged with the review of valuation evidence, into the unsound but plausible theories that have been advanced in the past to obtain low valuations. There is a consistent rejection in these findings of the absurd and fantastic valuation and depreciation methods used by certain consultants engaged in the lucrative business of establishing junk values for railway properties.

In Denver, track which was conclusively shown by the company's engineers to be in excellent serviceable condition due to proper maintenance was scheduled by the city's consultant at a negative value. That is to say, its value was listed as less than zero, and subtracted from the total of the remaining property. Photographs introduced by the company to show the condition of this track evidently led the court to doubt the accuracy of the city's evidence.

The cities of Minneapolis and St. Paul employed different consultants. Apparently they had little confidence in each other's methods and failed to compare their figures. As an example, separate valuations on two sections of a continuous piece of track over the Mississippi River bridge were submitted. That on the east half of the bridge was scheduled as being in 80 per cent condition, while the portion on the west half of the bridge, which had received the same maintenance and had carried identical traffic, was assumed to be in 50 per cent condition.

On this same property, passenger cars built at the same time in the company's shop and used interchangeably between the two cities were found to be in 22 per cent condition by the consultant for one city and in 72 per cent condition by the other.

Such inconsistencies in the results obtained and in the values found for identical property drew caustic comment from the commission. Apparently much of the evidence submitted on this basis was discounted—and it should have been. The decisions of the courts and the commission in these recent cases, it is to be hoped, will establish additional precedents leading to more accurate statements by consultants of this class.

Central Western Meeting Suggested

MORE and more during recent years the advantages of group thinking have been demonstrated in the electric railway industry. New ideas and views on public relations, ride merchandising, safety work, modernization of plant and operating methods, financing and a host of other modern railway subjects have taken root and developed as a result of railway men getting together, comparing notes, taking stock of their situation and discussing methods of improving their practice.

The American Electric Railway Association, together with its affiliated organizations, has, of course, been the greatest single agency for bringing railway men into personal contact with each other. The various state and sectional associations have also played an important part in this interchange of ideas. They bring railway neighbors together, stimulate friendships and at the same time co-ordinate the efforts of various operators in a given territory to solve the local problems of mutual interest. In the Middle West, the Central Electric Railway Association has been an outstanding example of the value of sectional co-operative thinking and effort. More recently the railway men of Missouri, Kansas, Colorado, Nebraska and Oklahoma have formed the Mid-West Electric Railway Association.

It has been suggested that the railways in the intervening territory, comprising the states of Iowa, Illinois, Wisconsin and Minnesota might profitably hold a combined meeting once a year. Of these states, the first three each has a state utility association. In Iowa and Wisconsin, a general utility meeting is held once a year, and the railway men in each of these states get together again for a second exclusively railway meeting. The Illinois association holds only one meeting a year, which is a combined meeting of all the utilities. Minnesota has no state association.

Many large and progressive railway properties are located in this territory. By combining the railway meetings of Iowa and Wisconsin, and including the properties in Illinois and Minnesota, one general railway meeting could be held, which would be of immense value and profit to all of the properties participating. Payment of a comparatively small fee by each man who attends would afford a simple means of financing the plan. Unquestionably the benefits derived would be far in excess of the cost in time and expense.

Continued Improvement Expected in Electric Railway Situation

A Survey of the Present Status of the Industry Made by an Official of a Large Manufacturing Company Indicates that Developments of the Past Five Years Have Put the Railways on a More Stable Basis with Bright Prospects for Future Prosperity

DIFFICULTIES experienced by the electric railways in the years immediately following the war, and the apparently growing competition of other modes of transportation, aroused speculation as to their future destiny. This caused some anxiety in the industries which depend upon the electric railways for a large portion of their business. For this reason an investigation was made for the benefit of William Wharton, Jr., & Company by Victor Angerer, vice-president, to determine the present status and future prospects of the railways. Through the courtesy of the company a summary is given below of this survey, which is supported by statistics obtained from authoritative sources.

Although in the minds of the general public an impression is somewhat prevalent that the street railway is on the wane and likely to be supplanted by other means of transportation, statistics do not bear this out. On the contrary, the survey indicates that many of the difficulties of the past have been or are being overcome. Figures show a consistent, steady though moderate growth of the electric railway business. They also show its importance and that no other mode of transportation has been found that would so adequately and cheaply meet the requirements of the public in the cities where the bulk of the electric railway business lies. A continuation of the growth of that business is to be expected for many years to come, although perhaps not in proportion to the growth of the population.

SOURCES OF PAST DIFFICULTIES

Ills from which the street railways have suffered since the war may be summarized as follows:

1. Over-expansion; in the prosperous times before the war many lines and extensions were built on speculative grounds for development of territory which later proved inadequate to support them. During the war trackage and equipment were added for traffic to and from localities which at the close of the war became dead.
2. Increased cost of operation and taxes without simultaneous commensurate increases in fare.
3. Unregulated jitney competition, in many cases fostered by a hostile public reluctant to accept the necessity for an increase in the street car fare.
4. The phenomenal increase in the number of private automobiles and taxicabs.
5. Competition of the motor bus, apparently made possible by improved highways.
6. Traffic congestion in the hearts of cities, making street car operation more costly and slower and causing passengers to desert the electric railways for other means of transportation which promise to take them to their destination more quickly.

The crisis of the ills mentioned in the first four counts was reached in 1919, when 48 street railway companies went into the hands of receivers. In the years 1918 to 1920 some 1,500 miles of track were abandoned. Considerable abandonment of trackage reported in later years was planned at that time, but actual suspension of service or dismantling of tracks did not take place until the necessary legal arrangements were completed.

The inconvenience caused by the abandonment of service on some lines and in some localities, as well as the investigations conducted by various bodies, brought the public and the authorities to a realization of the necessity for higher fares. As a result, in 1920 the average fare on the electric railways of the country had advanced to 7.5 cents from the former almost universal nickel. With this increased revenue to the railways came also a better feeling between the public and the companies and a better understanding of the dependence of one upon the other.

CONGESTION IS CAUSING AUTOMOBILE OWNERS TO RETURN TO PUBLIC CONVEYANCES

The unregulated jitney, while still active in some localities, has largely eliminated itself as a competitor of the railways through its own undependability and irresponsibility and perhaps through a better realization by the jitney owner of the actual cost of operating such a vehicle.

A more important factor restricting the growth of the electric railway has been the private automobile and the taxicab. The extent of this influence in city traffic and in the congested districts is almost impossible to estimate. Undoubtedly it has affected interurban travel and the once popular pleasure riding on trolley cars in the summer and on holidays. As an offset, a most remarkable increase has taken place in the riding habit much greater than the growth of the population. Despite the increased use of the automobile and the taxicab, therefore, taking the electric railways as a whole, the number of passengers carried continues to increase.

In the hearts of the larger cities the congestion created by the automobile and consequent traffic regulations and parking restrictions have largely served as a check to further growth of the use of the private automobile. This situation is inducing automobile owners to return to the public conveyance for city travel. The taxicab, no doubt, has taken a large part of this travel. It is figured that the taxicab now transports 3,500,000 people per day as against about 45,000,000 passengers carried by the electric railways. In consideration of the great difference in the rate of fare, however, the taxicab cannot be classed as a competitor of the railway. It furnishes a service that stands by itself for greater comfort and speed. Traffic congestion may again set the limits to the future growth of the taxicab traffic and to its function as a time saver. A conveyance more commodious than the street car and covering fixed routes, but carrying more passengers per square foot of street surface, may have to take its place. The de luxe bus may thus become a competitor of the taxicab and to some extent may even replace the private automobile for strictly city travel.

The competition of the motor bus, the survey shows, has attracted more attention to the future of the electric railway industry than has any other factor. The widespread construction of good highways and the development of the bus into a reliable motor vehicle led to bus routes being established in direct competition with the electric railways. A great propaganda for these lines was launched, mostly for exploitation and promotion purposes. Exaggerated statements in the sensational press, the somewhat hostile attitude of the public in numerous localities against the electric railways, and the public's enthusiasm for gasoline-driven vehicles are clouding sound judgment. The propaganda is still being pursued vigorously. Recently established or projected motor bus lines are heralded as replacing electric railways, but without stating that these electric lines were abandoned four or five years ago during the financial stress of the railways, or they are being substituted on non-paying lines. These statements give a wrong impression that the bus has forced the abandonment of the electric railway.

REPLACEMENTS OF CARS BY BUSES HAVE BEEN FEW

According to statistics recently compiled, five electric railways have abandoned service entirely and are now operating nothing but buses. Independent bus lines have entirely superseded electric railway service in seven cases. In addition to this, buses have replaced parts of electric railway systems in a number of cases. Altogether the survey shows bus service has replaced trolley service on less than 500 miles of track. This gives an indication of the comparatively small extent to which bus service is actually replacing electric railway service. More than 2,000 miles of bus routes being operated by the electric railways themselves as feeders or auxiliaries represent new transportation facilities.

Reliable information is not available regarding independent bus lines operated in direct competition with existing railways or steam railroads. Their number is quite large but seems to have affected the steam railroads more than the electric lines. Competing bus lines in some cases are believed to have been established with the sole view of forcing the electric railway to take them over or co-ordinate the service.

The exploitation of the bus at the present rate has created the prediction that history will repeat itself. The development is going too fast and too far, courting disaster, as has been the experience with the electric railways, and with the steam railroads in the middle of the last century.

All students and investigators agree that the electric railway is the best medium known for mass transportation of passengers. In the interests of the public it must be preserved and protected against unnecessary competition, and must be the foundation of the co-ordinated transit system of the whole community. The necessity riders who constitute the masses want cheap transportation, and the safest and most reliable and regular transportation in all kinds of weather. The bus has not been proved equal to the electric street car in these essentials.

The economic advantages of rails to reduce tractive effort and electric transmission to reduce cost of power have been called fundamentals of the ability of the electric railway to furnish cheap transportation. The introduction of one-man cars on less frequented lines or between rush hours, lighter cars, improvements in transmission lines and permanent ways are all tending to lower the operating cost as well as to reduce the amount of capital invested.

The requirements for transportation in the large American cities cannot be compared with those of large cities in Europe, such as London, Paris or Berlin, where buses are the principal means of public surface transportation. Those cities have not the concentrated business sections with skyscraping office buildings holding the equivalent of the population of a small city which we have in this country. Their business is spread over a much wider area and the cities themselves extend from the business center in all directions. Furthermore, the number of automobiles is extremely small compared with the number on the streets of American cities. The fact that notwithstanding this easier situation there is congestion in the heart of those European cities on account of the bus traffic gives strength to the argument that to follow their example and attempt to handle surface transportation in American cities by buses instead of by street cars would create such an increase in congestion that it would prove unbearable.

American cities grow very rapidly. A comparison of the census of 1910 and that of 1920 shows that cities of from 250,000 to 500,000 population have on the average increased 40 per cent. Cities from 500,000 to 1,000,000 have increased 35 per cent. Smaller cities under 200,000 population did not increase quite so fast, the average being only 24 per cent. The larger cities of more than a million increased only 15 per cent. This growth and the increased number of riders produced thereby must be taken care of by the street railways by more frequent service on existing track systems, followed by track extensions into newly settled sections. Therein is the difference between the past and the future. In the past speculative extensions of the street railway preceded the settlement and building up of the suburbs. In the future such extensions will follow only after the new sections have been fully developed and the necessary amount of traffic is assured. The private automobile and the bus may suffice during the development, but the assurance of permanent and regular service offered by the rail lines will sooner or later be demanded.

EXTENSIONS WILL OFFSET ABANDONMENTS

In the largest cities the problem has arisen as to when the large expenditure required for the building of rapid transit lines, elevated or subways is warranted. The actual carrying out of such plans has lagged behind the demands of growing population for additional transportation facilities. Statistics show that where such lines have been constructed they have had only a limited effect on the rate of continued increase in the number of passengers carried by the surface lines. In New York City it has been calculated that the increase in population adds more than 100,000 riders per day to the total number of passengers carried by the surface, elevated and subway roads.

There will no doubt be further abandonment of non-paying electric railway lines. This, however, is likely to be offset by the extension due to the natural growth of the cities. As a whole it would appear from the facts that the developments of the past five years have put the electric railway on a more stable basis than they were, with prospects of a moderate, continued growth for many years to come. Where statistical figures show a diminution in number of miles of track and number of cars operated, they really indicate a healthy deflation. Quite a number of small companies operating less than 10 miles of track have been eliminated. The large companies are firmly established and carrying a constantly increasing number of revenue passengers.

This general study of the status of the electric railway industry was made with the ultimate object of determining the probable influence of developments on the future special trackwork requirements of the electric surface railway. The conclusions reached are that the purchases of special trackwork are not likely to diminish, as some may mistakenly believe, but may be expected to be materially larger during the next few years than they have been lately.

The bulk of the requirements comes from special trackwork renewal in the paved streets of a number of cities comprising only about one-third of the total electric railway track mileage of the country. More than 50 per cent of the renewal demands are for tracks in the hearts of cities with more than 250,000 inhabitants. The permanency of these tracks is not likely to be

Determination of Special Trackwork Requirements

To arrive at the total amount of special trackwork now in service, the proportion that it forms of the total track operated on representative systems was studied. Figures obtained varied from 5 per cent on systems having a large amount of suburban and some interurban track to more than 10 per cent on urban systems. Percentages were then applied to the mileage figures of the country to give the approximate number of feet of track of special trackwork in service under the different kinds of operation. Dividing the special trackwork into its various representative units — i.e., single branchoffs, double branchoffs, crossings, crossovers, turnouts, plain curves, etc., of average dimensions—the average value per foot of track was figured, taking into consideration the type of special trackwork generally used under the different conditions.

The next and most difficult figure to determine was the life of the work under different conditions. Records and opinions of street railway engineers were consulted, as well as the records of the Wharton company of partial and whole renewals of layouts in different localities. The number of years given in the fifth item of the table are believed to represent a fair average.

In addition to the renewals there is the new work required for extensions of trackage due to the natural growth of the cities. This is still quite a factor which is not likely to be counterbalanced through any further abandonment of existing tracks in the cities.

Total figures from this calculation show that the special trackwork in service on the surface electric railways of the United States represents a present replacement value of more than $100,000,000, and that the normal annual requirements for renewals and new work should amount to approximately $12,000,000 at present-day prices. Of this sum possibly about 10 per cent represents work done by the railways themselves.

In making a comparison with the past it is seen that the urban trackage has not changed materially since 1917—extensions offsetting abandonments. Interurban trackage in the same period fell off some 1,300 miles, but this affected the special trackwork requirements in a very small way. It meant that the total amount of special trackwork in service, at present values, was reduced less than 1 per cent and the annual renewal requirements were reduced by less than one-half of 1 per cent. The potential market for special trackwork for surface railways is, therefore, the same now as it was seven years ago.

Surface railways for several years past have not fully maintained their trackwork and have resorted to many temporary repairs. Some have kept their tracks in first-class condition, but taken as a whole throughout the country they have not done so and their purchases of special trackwork material for renewals, taken as a whole, averaged not more than about 60 per cent of normal during the past five years. As the financial condition of the companies improves, their policy will probably turn to ultimate economy as the object in place of the temporary economy practiced. Temporary repairs only postpone and increase the eventual heavier expenditures, and poorly maintained trackwork adds to the cost of upkeep of the rolling stock.

It cannot be expected that the purchases of special trackwork will at once take a jump, but the prospects are that they will fairly rapidly increase in the next few years from the present low level until they reach normal and possibly go beyond normal to make up for the shortcomings in maintenance in the past.

A factor that will have considerable influence is the length of time that a piece of special trackwork can be kept in serviceable condition, without renewal and without detriment to rolling stock and motive power, by such modern means of repairs as the electric welding of worn-out parts. It is generally admitted that such repairs cannot be repeated indefinitely, but as to when they become impractical or uneconomical and whether they are economical at all when applied to certain parts of special trackwork has not been sufficiently determined.

Another important factor has lately appeared. It is the demand of the public for less noise in the operation of the electric cars. The increased noise through the restricted upkeep, of late years, of both the cars and the track has probably brought this phase of electric railway operation more forcibly to the attention of the public, especially when comparison was made with the quieter operation of the rubber-tired motor vehicle. Investigating engineers and travelers abroad have also found a very noticeable difference in the noise produced by the electric cars in American cities and the much quieter operation in the cities of Europe, where much attention is paid to the upkeep of the cars and track.

Electric railways must heed demands from their customers—the public—and to eliminate noise the track department and equipment department must work hand in hand. The first step is better upkeep. This factor is, therefore, likely to counteract the retarding influence to complete renewals of the electric welding repairs and to hasten rehabilitation. It will also undoubtedly, in time, cause some detail changes in the construction of cars and trucks and in special trackwork to a more extensive use of the higher, slower wearing types of work as well as to a demand for greater accuracy and higher finish of the work. Developments in that direction which will affect the manufacturer of special trackwork both in value and volume are to be expected.

SPECIAL TRACKWORK IN SERVICE ON SURFACE RAILWAYS AND NORMAL RENEWALS

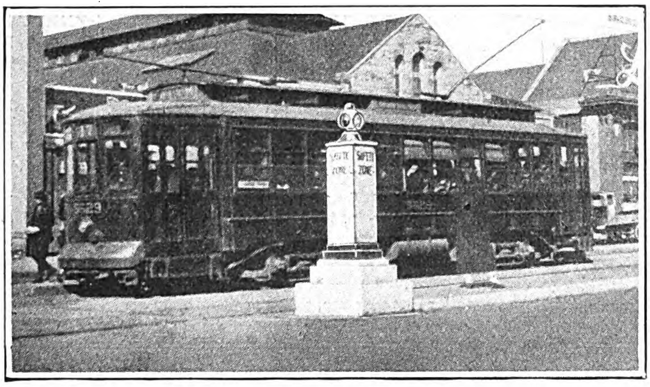
	Paved City Streets		Unpaved Streets and Highways		Total and Averages
	Cities Over 250,000	Small Cities and Outskirts	City and Suburban	Interurban	
Per cent of special trackwork to total trackage	10	5	3	2	2.8
Number of feet special trackwork	3,000,000	2,250,000	1,650,000	1,750,000	8,650,000 = 1,638 ¼ miles
Average value per foot of track	$16.00	$12.00	$10.00	$7.00	$11.38
Total value	$48,000,000	$27,000,000	$16,500,000	$12,250,000	$103,750,000
Average life — years	8	10	12	15	10
Renewals per annum	$6,000,000	$2,700,000	$1,350,000	$800,000	$10,850,000
Requirements for new track per annum	....	$500,000	$300,000	....	$800,000
Total estimated requirements of special trackwork for surface street railways per annum at current prices					$11,650,000

disturbed materially. The purchases for renewals during the past five years have been decidedly subnormal, and the returns to more normal upkeep for ultimate economy and efficiency under the improved conditions of the railways can be looked forward to.

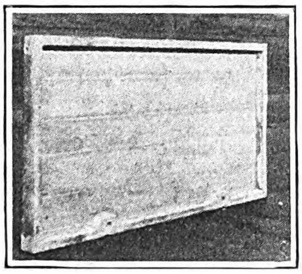
What may be considered normal average annual renewal of special trackwork at present-day values, figured from the probable total amount in service and the average life thereof, is given in the accompanying table. Adding thereto a moderate amount of new work and discounting the work done by the railways themselves gives a figure of $10,500,000 as the potential amount of the normal annual business in special trackwork material. This is for surface railways only and does not include elevated railways and subways, the business from which is slowly increasing as new rapid transit lines are added in the larger cities.

Trolley Loading Platforms in Baltimore Marked with Blinkers

INTERMITTENT warning lights of the type which are widely used to mark dangerous street intersections are being tried in Baltimore to mark the ends of trolley loading platforms. In this case the loading platforms are built and installed by the United Railways & Electric Company, while the warning lights are put up by the city. An interesting feature is the sectional construction of the platforms. Concrete slabs about 8 ft. long and 4 ft. wide are used for this purpose. They are hollow on the under side, as shown in one of the accompanying illustrations. The sections are made in the company's yard and are carried on flat cars to any desired location. This design makes it possible easily to install and remove the platforms or to increase and decrease their length. The blinker lights are made by the American Gas Accumulator Company.



Above, Intermittent Warning Lights Are Used at Safety Isles in Baltimore

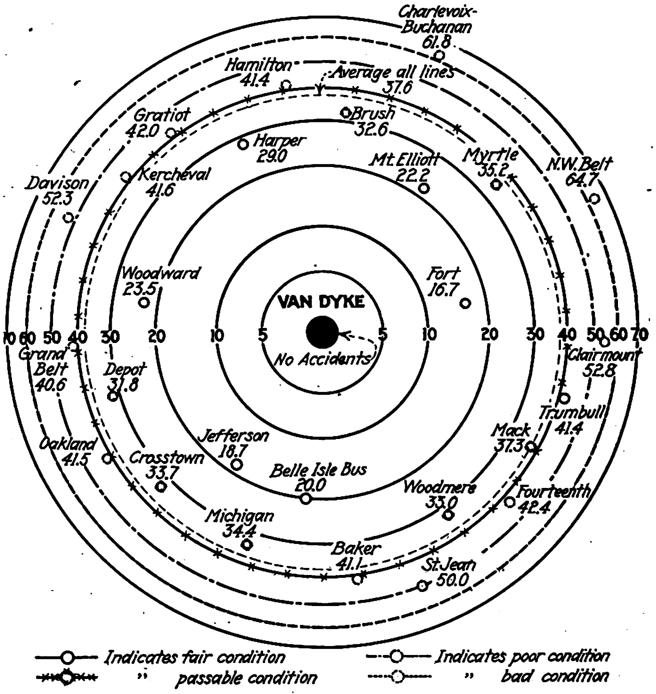


At Left, Hollow Concrete Slabs of This Type Are Used in Building Loading Platforms

Previous to their installation several unlighted types of sign were used to mark safety isles, but proved unsatisfactory on account of their being difficult to see at night.

Accident Prevention Target in Detroit

TO CREATE interest in the reduction of accidents and to present the results accomplished in interesting form, the target chart shown in the accompanying illustration was designed by the Department of Street Railways of Detroit at the suggestion of H. M. Gould, assistant general manager. This chart is called a "No Accident Bull's Eye" and is made up in the form of blueprints approximately 4 ft. square. These prints are displayed at the various carhouses and show in a forceful and interesting way the comparative accident record of each car line on the system. The figures represent the number of accidents per 100,000 car-miles. The center of the bull's eye represents no accidents.



Something to Shoot At

"No Accident Bull's Eye" used by the Department of Street Railways of Detroit for increasing interest in accident prevention measures. Each "bullet hole" indicates the record of an individual car line and the figures show the number of accidents per 100,000 car-miles.

On the targets displayed in the carhouses, colors are used to make them more attractive and also to tie them up more closely with street railway operation. Standard railway signal colors are used for this purpose. The "60" circle is colored red, as are also the "bullet holes" outside the "50" circle. This is intended to indicate danger to the lines whose scores carry them that far out from the center. The "50" circle is colored yellow, together with the "bullet holes" outside the "40" circle. The "40" circle and "bullet holes" outside the "30" circle are colored green. The "30" circle and everything inside of this point are white to indicate clear track and safety.

Each month the targets are displayed in conspicuous places in the carhouses. In calling attention to the results accomplished, and in urging the men to renewed interest in accident reduction, the company said:

"If every trainman will aim at the dead center and hit it, every line will make a bull's eye. Impossible? Perhaps, for some, but don't let it be you. Clean up the old blunderbus, adjust the sights, keep your head level, your arm steady, your eye clear, draw a bead on the center—and Shoot!"

Track Reconstruction Cost Reduced by Use of Modern Equipment

Rail Pre-Welded in Lengths Up to 3,180 Ft. Was Installed by Birmingham Electric Company Without Interruption to Service—Joints Were Thermit Welded Under Pressure Produced by Special Clamps—Concrete Mixed at a Central Plant Was Transported and Poured from an End-Dumping Rail Car

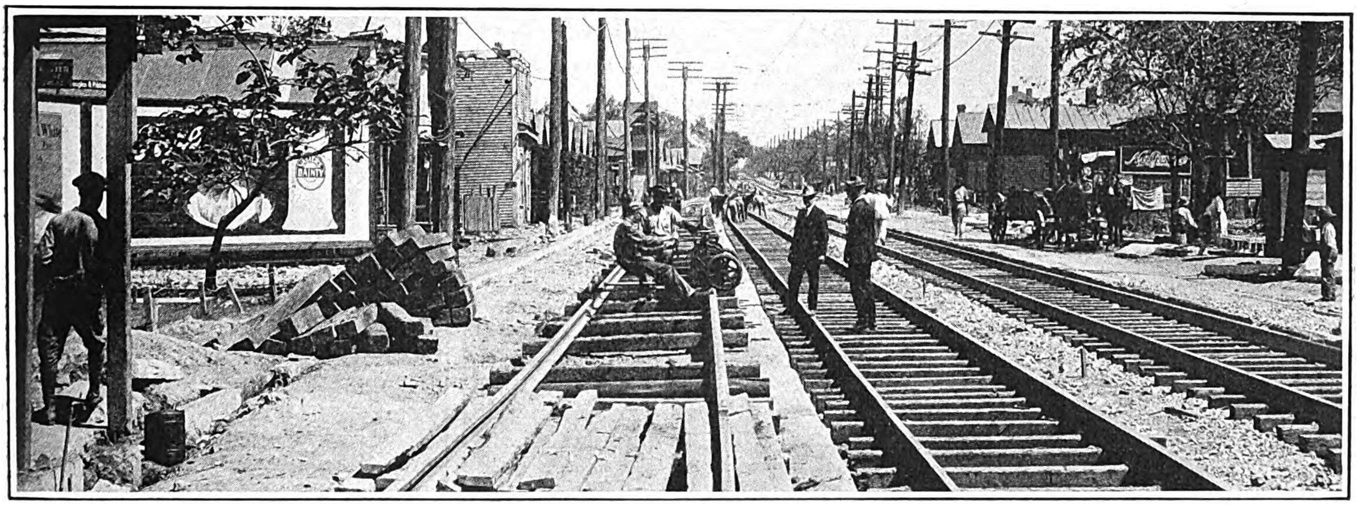
By A. Taurman
Superintendent Equipment, Way and Structures Birmingham Electric Company
Birmingham, Ala.

During the year 1924 the Birmingham Electric Company was faced with the task of rebuilding the equivalent of approximately 10 miles of single track. This was on a street which is part of the state highway system and where the cars are operated on a six-minute headway during the non-rush hours, with three-minute service during the rush. To make the matter more difficult there was no parallel line to serve this territory nor any parallel paved street to which the vehicular traffic could be diverted. It was, therefore, necessary to rebuild the track under traffic and with the least possible delay to car service.

To accomplish this the company decided to pre-weld the new rail alongside the existing track and then move it into position in long lengths. Feeling that the construction forces of an electric railway can compete successfully with local contractors in the matter of cost only when they have an adequate equipment of modern machinery, the company provided up-to-date cranes, work cars, welding and grinding apparatus, and a special end-dumping car to transport mixed concrete. By having a good organization and modern track machinery it was possible to do this reconstruction work at a cost substantially lower than on similar jobs in the past.

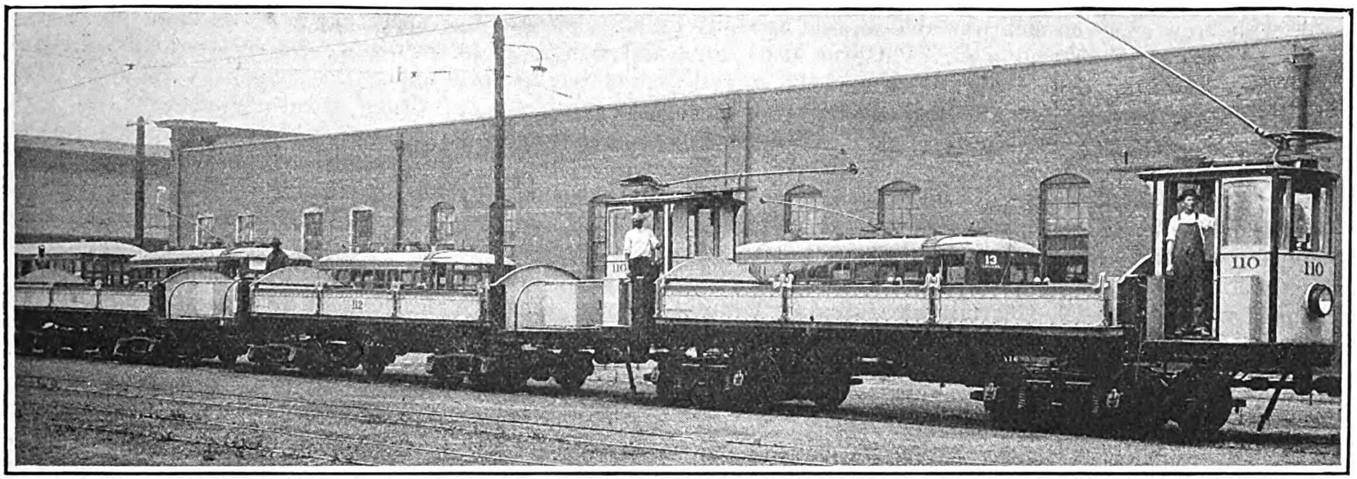
Slag ballast, wood ties, T-rail and brick paving were used. Eight inches of slag ballast was placed on the old track foundation. Creosoted ties with tie plates were used. The rail was Tennessee Coal & Iron R.E. 101.69 6-in. tee section. A 6-in. concrete slab with a 1-in. cushion of sand serves as a foundation for the paving. Three-inch bricks were used grouted with concrete to within ½ in. of the top of the brick, so a hot asphalt binder was then poured over the top and the surface covered with sand. It was agreed between the railway and the city to allow the ends of the bricks to go under the head of the rail inside the track and to come flush with the outer rail head and in the dummy strip.

After deciding on the type of track structure most desirable for this location, the next question was that of selecting and assembling equipment suitable for the rapid construction of the line. A Universal crane mounted on a 7½-ton Mack chassis was equipped with a clamshell bucket and used for excavating. The old track was stripped of its chert ballast, which was thrown to one side and hauled away either by Differential dump car or by motor truck, depending on the quantity to be hauled at any particular time. An end-dump car of special design was used to haul concrete from the mixing plant and deposit it between the rails.



On a Recent Track Job in Birmingham Long Sections of Rail Were Thermit Welded Before Being Installed. Joints Were Finished by a Rotary Grinder

Usually in the construction of track under traffic the electric seam-welded joint has advantages over other types. Before undertaking this job a series of tests was made by the company on seam-welded joints and thermit-welded joints. From this it appeared that the thermit-welded joints could be successfully used under these conditions by welding long lengths of rail before placing it in the track. A question arose, however, as to the best method of securing compression on the joints while they were being welded. This was accomplished by placing clamps on each end of the abutting rails and connecting them by 1-in. steel rods. An accompanying illustration shows the arrangement of



Three-Car Differential Dump Trains Used in Birmingham to Haul Material for Track Jobs

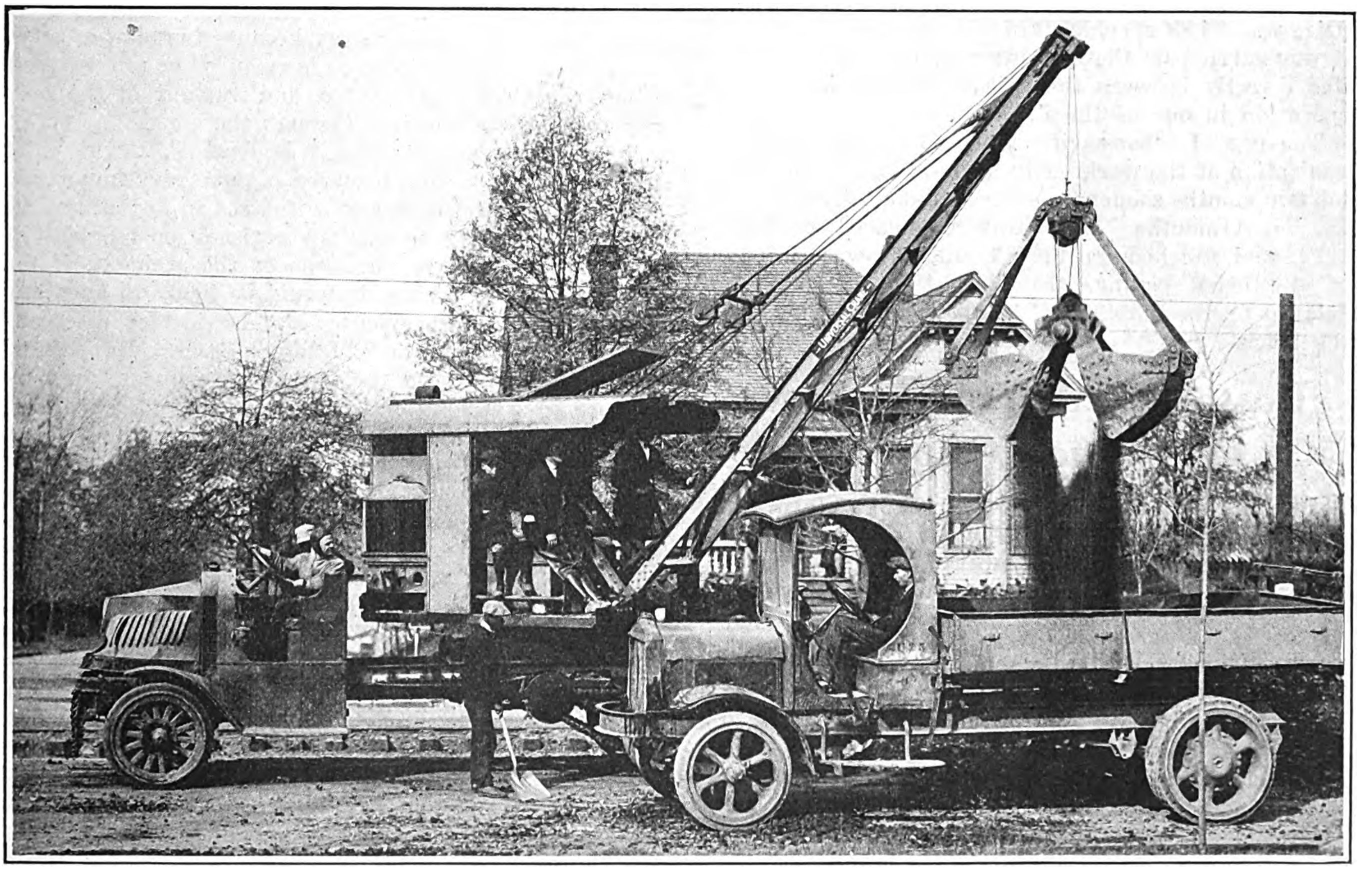
these clamps. They not only pull the rail into proper line and surface, but hold the insert in place while the mold is being put in position. They also make it possible to secure sufficient compression to upset the ends of the rails while the weld is being made.

After this, the new rail was laid parallel to the existing track and spiked down to the correct gage, on old ties, which were placed on the pavement near by. One of the illustrations shows this step in the procedure. This was done in order to permit the use of a Universal track grinder to finish the newly welded joints.

Rail was welded into lengths, at first of 950 ft., and later increased to as much as 3,180 ft. in a single section. After rails were properly welded and ground they were slid over by using crowbars into the track area and laid closely alongside the existing rails. At every fifth or sixth tie they were spiked down. This was all accomplished without interruption to car service. The old rail was then cut into pieces and moved to one side. New rail was then slipped in and connected up. Existing ties and plates were used to support the new rail, except where inspection showed a need for renewal. Afterward the old rail was removed and the cars operated over the new while it was being surfaced and lined up.

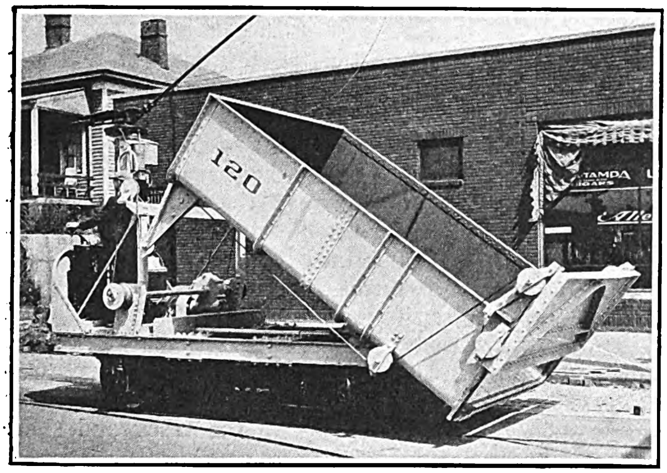
An interesting feature of this construction work was the rapidity with which rail could be transferred from the side of the street into place in the track area. In one instance 1,600 ft. of rail was moved over into position in five minutes. Cars were operated over the new rail as soon as it went into the track and there was practically no interruption to service.

Careful organization of a welding crew reduced materially the length of time required to make a thermit



Universal Crane Mounted on a 7½-Ton Mack Chassis Removing Old Ballast weld. One crew of seven men was able to weld as many as 60 joints in an 8½-hour day. Patterns used for making molds, the mold boxes themselves and the special clamp used for compressing the rail ends during the welding process are shown in accompanying illustrations.

To prevent vehicular congestion on this street an unusual method of placing the concrete was adopted, using a specially designed single-truck rail car. A single section of an ordinary Differential dump car was arranged with a modified hoisting apparatus so that it could be dumped endwise instead of sidewise. The railway arranged with a local construction company to purchase concrete already mixed at the latter's plant. For this purpose a special central mixing plant was installed to provide 300 cu.yd. of concrete a day. The price was $4.90 a cubic yard. From the mixing plant it was carried by the end-dumping rail car and deposited directly between the rails. The car is shown in operation in one of the illustrations.



A Specially Designed End-Dumping Rail Car Was Used to Place the Concrete Without Interruption to Car Service

The use of labor-saving machinery and careful organization of the work enabled the railway to finish the job two months sooner than the original estimate, which was eight months. Work was commenced on Sept. 2, 1924, and finished on Feb. 1, 1925, except for some of the brick paving, the completion of which was delayed by the inability of the manufacturer to supply the brick.

Boston Completes Accident Prevention Campaign

Boston Elevated Concludes Its Series of Helpful Talks on Safety—Precautions to Prevent Various Types of Accidents Are Given

THE Boston Elevated Railway has just completed a series of successful talks to trainmen on safety topics. These talks, as explained in page 185 of the issue of this paper for Jan. 31, are issued as if given as speeches at mass meetings of the employees and are sent by mail to each employee. Louis H. Butterworth, claims attorney of the company, was the speaker at the "meeting" on Jan. 28.

Mr. Butterworth took the position that the present generation is no more careless than preceding ones, only that it is more in a hurry and is able to rush about with greater speed than its predecessors. This means that motormen and bus operators must exercise great care and skill to avoid accidents. He declared car collisions could be grouped under six classes as follows: The rear-end collision, which is nearly always the fault of the operator of the rear vehicle. The precaution to follow is not to run too close to the vehicle ahead and to have the car well under control in case the driver ahead should stop suddenly. The second type of collision, the head-on, is usually the fault of the auto driver, but motormen can frequently clear themselves of all blame if they are alert enough to sense the danger and bring their cars to a dead stop before the actual collision takes place. The third is the sidewipe, often occurring when a motorman tries to pass a vehicle which has a load projecting over its side. The leg of a chair or other part of the load may just catch the side of the car and break one or more windows and shower the passengers with glass. Such collisions often occur on icy streets where there seems to be sufficient space for the car to pass the loaded truck, but this space will be found to narrow suddenly to nothing by the truck sliding or slipping off a ridge of snow or ice. Brainwork is the only precaution. The fourth type of collision is the rear-end swing on curves. The conductor should look out for this kind of accident, particularly when the car has made a stop and an auto or team drives alongside it on a curve. He should warn the motorman of such condition. The fifth type is collisions of apparatus of the fire and police departments, which have right-of-way. For this there is no defence. The sixth is "cutting in" collisions, the most frequent kind of vehicle collisions. Motormen may be rarely at fault for collisions of this kind, but as the trolley car is the rear vehicle, juries often say that the company must pay for the damage. The cross-street collision is the seventh and last type to be considered. While not more frequent than the cut-in collision, there is greater likelihood of injury because the blow is given at right angles. Special care is required at cross-streets where the view is obstructed, and warning of the car's approach should be given through the gong.

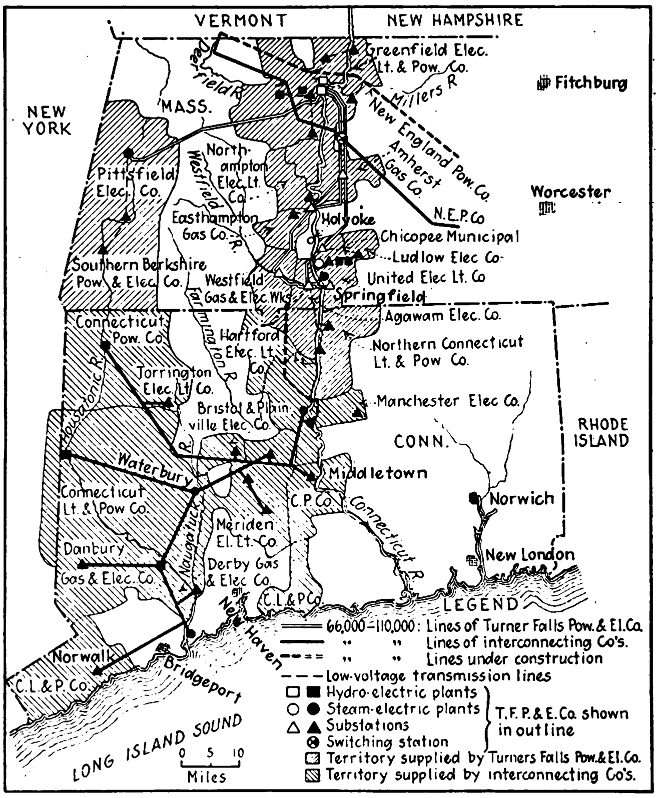
At the meeting on Feb. 4 Michael F. Doyle, chief investigator of claims, declared it to be very important, while getting the names of witnesses in an automobile accident, to obtain as well the registration numbers of other automobiles at the scene of the accident, if the drivers or other occupants would be likely to have any knowledge of the accident. Mr. Doyle also discussed boarding, alighting and "falling" cases. He pointed out how alertness on the part of the guards or conductors in watching passengers board and leave, and the care of motormen in starting the car without jerks, could reduce these classes of accidents. Other "don'ts" related to giving the starting signal too quickly when an old or maimed person is about to leave or board the car, allowing the passenger to leave bundles where some one might trip over them, of neglecting to see that the floor is in good condition, especially in winter, etc.

On Feb. 18 David S. Lee dwelt on how accidents are paid for, and Miss Mary L. Donnelly, head stenographer of the department, on Feb. 25 mentioned some amusing claims, as that of the passenger for his hat because it was blown off while he was riding in an open car. On March 4 R. L. Mappleback, trial attorney, gave several striking examples of the way in which slight troubles on the car developed into serious accidents when described in court. The best remedy, he said, is to avoid accidents.

Holyoke Contracts for Power

Some of the Considerations Which Influenced the Holyoke Street Railway Company to Purchase Its Electrical Energy Instead of Continuing to Generate It in Its Own Plant—Railway's Generating Plant Is Purchased by the Power Company

By George E. Pellissier
Assistant General Manager Holyoke Street Railway


VERMONT
NEW HAMPSHIRE
NEW YORK
MASS.
Deerfield R
Greenfield Elec. Lt. & Pow. Co.
Millers R
Fitchburg
New England Pow. Co.
Amherst Gas Co.
N.E.P. Co
Worcester
Pittsfield Elec. Co.
Northampton Elec. Lt. Co.
Westfield R.
Easthampton Gas Co.
Holyoke
Chicopee Municipal
Ludlow Elec Co
United Elec Lt. Co
Springfield
Southern Berkshire Pow. & Elec. Co.
Westfield Gas & Elec. Wks.
Farmington R.
Agawam Elec. Co.
Connecticut Pow. Co.
Hartford Elec. Lt. Co.
Northern Connecticut Lt. & Pow Co.
Torrington Elec. Lt. Co.
Housatonic R.
Manchester Elec Co.
Bristol & Plainville Elec. Co.
CONN.
RHODE ISLAND
Waterbury
Middletown
Connecticut Lt. & Pow Co.
C.P. Co.
Connecticut R.
Norwich
Meriden El. Lt. Co.
Naugatuck R.
Danbury Gas & Elec. Co.
Derby Gas & Elec Co.
New London
C.L.&P. Co.
New Haven
Norwalk
C.L.&P. Co.
Bridgeport
LONG ISLAND SOUND
0 5 10
Miles
LEGEND
66,000-110,000: Lines of Turner Falls Pow.& El.Co.
" " Lines of interconnecting Co's.
" " Lines under construction
Low-voltage transmission lines
□ ■ Hydro-electric plants
○ ● Steam-electric plants
△ ▲ Substations
Switching station
T.F.P.&E.Co. shown in outline
Territory supplied by Turners Falls Pow.&El.Co.
▨ Territory supplied by interconnecting Co's.

Territory Served by Turners Falls Power & Electric Company and Interconnecting Companies

After operating its own power plant for the past 30 years, the Holyoke Street Railway recently decided to discontinue the generation of electricity and has entered into a contract with the Turners Falls Power & Electric Company of Greenfield, Mass., for the supply of all the electrical energy which will be required in the conduct of its business for the next twenty years.

While the results obtained from the isolated power plant which is now to be abandoned have been eminently satisfactory, both as to cost and reliability, changes in conditions since the plant was built made the directors weigh very carefully the advantages and disadvantages of purchasing power before making the additional investment which would soon be necessary if the company was to continue generating its own power.

When the road was electrically equipped in 1891, and until the year 1895, all the electrical energy required for the operation of the Holyoke Street Railway was purchased from the Holyoke Water Power Company. In the latter year the railway company decided to build its own power plant, partly because the voltage regulation of the hydro-electric machines of the Water Bureau Company, in use at that time, was not very satisfactory, partly because the cost of purchased power was high, but also largely because the electric railway system was expanding so rapidly that the purchase of sufficient power for its requirements appeared difficult.

Its first power installation consisted of three 300-kw. direct-current generators direct connected to steam engines. This installation proved to be very satisfactory, and as the maximum distance the energy had to be transmitted at that time was less than 5 miles the losses in distribution were not excessive.

In the next decade the extension of the Holyoke railway system necessitated the enlargement of the plant to furnish the additional energy required. During this period the company acquired several small connecting railway properties, one of which had a small steam station at North Amherst. This station was kept in operation as it was some 20 miles from the main power station at Holyoke, and it was obviously out of the question to transmit the necessary energy at direct current. These extensions and consolidations shifted the center of gravity of the power load several miles from the main power station, involving serious energy losses in transmission, in addition to the inefficiency of operating the small steam station located at North Amherst.

In consequence, in 1915, contracts for energy were made with the Turners Falls Power & Electric Company, which had recently completed its hydro-electric plant on the Connecticut River at Turners Falls and had erected substations at Amherst, Mount Tom Junction and Alderville, all of them in close proximity to the distribution lines of the street railway company. The amount of energy contracted for was all which could be economically supplied from these stations and amounted approximately to 2,000,000 kw.-hr. a year, or one-fourth of the Holyoke Street Railway Company's total requirements. This permitted the railway to shut down its small Amherst station. As the power company had no substation or transmission lines in Holyoke and as the cost of generating power in the street railway plant, which had recently been overhauled, compared very favorably with the price of purchased power, there was no incentive at that time for the company to abandon its main plant, which was then in good operating condition.

Reasons for Purchased Power Today

In the ten years which have elapsed since 1915, several important changes in conditions have had a decisive influence in the company's decision to purchase electrical energy instead of continuing to generate it in its own station.

First in importance was the difficulty in financing the extensions and modernizing of the existing plant, which would have involved an expenditure of approximately $750,000. Under the laws of Massachusetts, electric railways are not allowed to issue stock at less than par and can issue bonds only up to the amount of capital actually paid in. For the past few years, on account of the financial difficulties experienced by many electric railways due to rising costs, bus competition, etc., electric railway stock, even of roads which have been able to maintain the payment of dividends, has not been considered a particularly attractive investment, so that, at present, few if any of the electric railways in Massachusetts can issue stock at par. In the case of the Holyoke Street Railway, although in excellent physical condition and with a continuous dividend record extending over a period of 30 years with the single exception of 1917, when the company passed its dividend rather than curtail the maintenance of the property, the stock could not be issued at par at the present time. As under the law it would be possible to issue only $200,000 additional in bonds, the question of financing the necessary power-house improvements was a very important factor in the decision.

A second factor was the attractive rate offered for electrical energy by the power company. This rate was possible because the power company could supply a great portion of the energy from existing transmission lines and substations and had arranged to use the existing steam generating station of the Holyoke Street Railway as a substation from which to supply the remainder of the electrical energy required for the operation of the railway system. This means that practically no change will be required in the distribution system other than that necessary in connection with the transfer of the conversion now in the carhouse at Amherst to the substation of the Turners Falls company, which is about a mile nearer the center of gravity of the load. This change will eliminate the expense of substation operators at the carhouse.

Three Clauses of Holyoke Street Railway Contract for Purchase of Energy

ARTICLE 9. RATES

(a) Base Rate per Kilowatt-Hour. For all electrical energy delivered by the power company to the railway in each month and measured as set forth in Article 8 hereof the railway shall pay the base rate of one and eight-tenths cents ($0.018) per kilowatt-hour.

(b) Change in Base Rate Due to Cost of Coal. If on the first day of any month the market price of coal as hereinafter defined is greater than eight ($8) dollars per gross ton (2,240 lb.) then the railway shall pay an additional rate per kilowatt-hour for all kilowatt-hours paid for during such month. Said additional rate shall be the amount of seventy-five ten-thousandths of a mill ($0.0000075) for each 1 cent ($0.01) by which the average cost of coal per gross ton as hereinbefore stated exceeds eight ($8) dollars.

If on the first day of any month said market price of coal is less than seven ($7) dollars per gross ton (2,240 lb.), then the rate per kilowatt-hour to be paid by the railway for all kilowatt-hours paid for during such month shall be reduced as herein provided. Said reduction shall be the amount of seventy-five ten-thousandths of a mill ($0.0000075) per kilowatt-hour for each 1 cent ($0.01) by which the average cost of coal per gross ton as hereinbefore stated is less than seven ($7) dollars.

The market price of coal whenever referred to in this article shall mean the market price f.o.b. cars at Chicopee Junction, Mass., of bituminous coal having from fourteen thousand (14,000) to fourteen thousand five hundred (14,500) British thermal units per pound.

(c) Minimum Charge. In consideration of the investment made by the power company to serve the railway and the maintenance by the power company of its plant and equipment in condition at all times to supply the electrical energy herein contracted for, the railway agrees that if in any period of twelve (12) months during the continuance of the contract beginning on the first day of any January and ending on the thirty-first day of the following December the railway shall actually take under this contract less than six million five hundred thousand (6,500,000) kilowatt-hours of electrical energy, it will pay to the power company at the end of said period of twelve (12) months at the base rate set forth in paragraph (a) of this article for the number of kilowatt-hours equal to the difference between six million five hundred thousand (6,500,000) and the number of kilowatt-hours actually taken as aforesaid. This minimum amount of electrical energy to be paid for hereunder as above provided shall be increased from time to time in direct proportion to each and every increase in the total amount of electrical energy which the power company is required to keep available for the use of the railway as provided in Article 4 hereof.

ARTICLE 15. ARBITRATION

In the event of a difference of opinion as to the interpretation of the several articles of the contract, or as to the fulfilling of its conditions by the respective parties, the parties hereto do mutually agree that the questions be submitted to a board of arbitration consisting of one member, if the parties are able to agree upon such person, otherwise consisting of three (3) members, one appointed by the power company, one by the railway, and the third chosen by the chairman of the Department of Public Utilities or the chairman of the board which shall then have the public duties now performed by said department, and in case such chairman fails to make such appointment within sixty (60) days of the request to him so to do, the third arbitrator shall be chosen by the other two, to hear the parties and to decide such questions. The decision of said arbitrator or any two of the three arbitrators shall be final and binding. In the event of either party failing to appoint an arbitrator within ten (10) days after written request from the other party, such arbitrator, as well as the third arbitrator shall be appointed by the chairman of the Department of Public Utilities or the chairman of the board which shall then have the public duties now performed by said department. The expense of the board of arbitration shall be shared equally by the parties hereto.

In case any difference of opinion shall arise as to the construction or performance of any of the covenants or agreements herein contained, such difference shall cause no interruption in the transaction of the business contemplated by this contract, and all such business shall continue to be transacted, and all payments hereunder to be made in the same manner in which the same have been transacted and made prior to the arising of such difference until the matters in difference shall have been fully determined by agreement or by arbitration as herein provided.

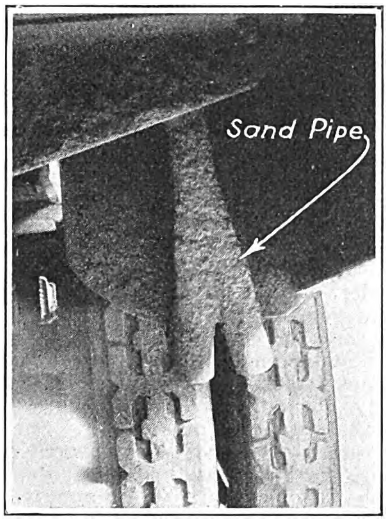
ARTICLE 16. REVISION OF RATES

At any time during the first three (3) months of the year 1936, and of the year 1941, either party hereto may apply to the Department of Public Utilities for a revision or alteration of any or all of the provisions of Article 9 of this contract relating to payments to be made by the railway for or in connection with the electrical energy delivered or kept available under this contract, including the minimum amount of electrical energy to be paid for, and thereupon said department shall have full power to revise and alter any or all of the aforesaid provisions in such manner as said department shall determine to be just and equitable, with due regard to the interests of both parties, and the revisions and alterations so made shall be final and binding upon both parties and shall become effective at such time not earlier than the date of the application therefor as said department may determine.

Whenever the Department of Public Utilities is herein referred to, such reference shall be taken to mean either said department or such other department, board or commission as shall have at the time of any application made hereunder the general powers and duties which are now vested in and imposed upon said Department of Public Utilities.

Sand Boxes on Buses

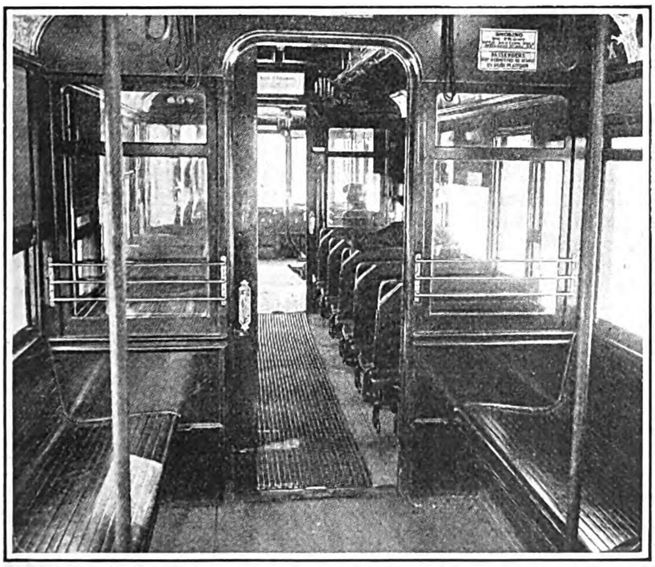
SAND boxes have been installed on the buses operated by the Des Moines City Railway, Des Moines, Iowa. The sand is controlled by a mechanical lever mounted near the emergency brake lever in a position convenient to the driver. Sand boxes are located under cross-seats on each side in positions immediately above the sand pipe outlet. A rod runs back from the driver's control lever and is connected by small bell cranks with the slide valves under the sand boxes. The arrangement is such that the valves on both sides of the bus are operated at the same time, thus discharging sand in front of both rear wheels. These wheels carry dual pneumatic tires, and each sand pipe has two outlets so as to distribute the sand under both tires.



Sand Boxes on the Buses of the Des Moines City Railway Are Arranged to Prevent Skidding on Slippery Pavements

Seat Rearrangement on Los Angeles Cars Proves Popular

A REARRANGEMENT of seats was made recently on a test car of the Los Angeles Railway and tried out on a crosstown line. The cars of this company have open ends and an inclosed center section separated by two bulkheads with sliding doors.



Longitudinal Seats in the End Sections of This Car Provide Larger Loading Platforms

Reversing the plan in use on the majority of the cars, the seats in the open ends on the test car were placed longitudinally and cross-seats were installed in the center section. The purpose of the longitudinal seats was to provide more space on the loading platforms and reduce the congestion on the back end. A postcard vote of passengers showed a five to one preference for the new arrangement.

The Readers' Forum

PITTSBURGH RAILWAYS COMPANY

PITTSBURGH, PA., March 28, 1925.

To the Editor:

I have read with unusual interest your article giving the facts regarding the St. Louis situation and heartily approve your method.

The conclusion reached by me after reading your article is that the people of St. Louis are going to pay a large penalty, either in impaired service or excessive cost of service or both, for their failure to bring about a co-ordination of street railway and bus services.

The unbiased and frank statement of all the essential facts you have made seems to me to be in line with the only worth-while method of attacking any unsound practice and especially the vicious practice of destructive competition.

T. FITZGERALD,
Vice-President.

Comment on the St. Louis Situation

MOUNT VERNON, N. Y., March 25, 1925.

To the Editor:

Your article in the March 14 issue on "Transit Conditions in St. Louis Today" is, to use a bromidic but truthful phrase, worth a whole year's subscription. It is of the essence of good journalism to tell the truth regardless of consequences—and, still better, to tell the truth from first-hand study.

The situation in St. Louis well illustrates the adage that "There is much to be said on both sides." You have fairly set forth all that can be said by both parties. When we interpret the data so clearly stated we become aware that this is far more a conflict between two transport undertakings than between two modes of transport. It is made obvious that when car and bus are run by separate concerns, clashing and overlapping are inevitable; but that when car and bus are run by one concern the public can get the advantages of de luxe bus service without losing the great benefits of necessity trolley service.

You have done wisely in refraining from comment on the information presented. Doubtless, each man will view your facts through the lens of his prejudices, yet the truthfulness of your outline will survive all distortion. At a critical moment, you have permitted the industry to see to what extent the incursion of the independent bus is due to genuine demand and how much to the vulnerable opening afforded by an electric railway bound in the thongs of receivership. May your work prove more immediately fruitful than the jitney studies which the ELECTRIC RAILWAY JOURNAL of the past decade was privileged to offer to its readers.

WALTER JACKSON.

With the advent of the first warm spring-like days, the New York Railways, New York City, commenced the operation of open cars on the Broadway line. To attract passengers these cars carried large bulkhead signs with white letters on a black background reading "Ride in the open."

Association News & Discussions

Changes in A.S.T.M. Specifications

As the proceedings of the American Society for Testing Materials are not available to all electric railway men a brief summary of those matters of special interest to electric railways which have come before the society during the past year is given.

Revisions have been made in a number of the specifications coming under the jurisdiction of the committee on steel. These include specifications for steel track spikes; specifications for welded and seamless steel pipe; specifications for open-hearth steel girder and high T-rails. In all of these the changes, if any, are of minor importance.

The revised specifications for structural steel for cars now adopted as standard provide an important change in the addition of a paragraph, which recognizes the use of "copper-bearing" steel, the rust-resisting properties of which have been the subject of much study during the past four years. Other revisions apply to the preparation of test specimens and to the weight of individual plates ordered to thickness.

Specifications for steel castings amended and adopted in 1924 as tentative standard relate to the heat treatment of Class A castings and Class B castings (the former not requiring heat treatment unless specified) and explain that the heat treatment may consist of annealing, or of normalizing, or of normalizing followed by annealing, or of normalizing followed by a drawback to a temperature below the critical range. No castings quenched in any liquid medium are to be offered under these specifications.

Annealing consists in allowing the castings to cool after pouring to a temperature below the critical range, then reheating them to the proper temperature to refine the grain and permitting them to cool uniformly in the furnace. In normalizing, on the other hand, the castings are allowed to cool after pouring, the same as for annealing, to a temperature below the critical range. They are then reheated to refine the grain, also the same as in annealing, but instead of allowing them to cool in the furnace, as in annealing, they are allowed to cool outside the furnace in still air. The old maximum limit of tensile strength has been omitted, it being felt that no maximum limit should be specified.

Various revisions were presented this year for the first time in specifications for carbon steel rail, low-carbon steel splice bars, quenched carbon steel track bolts, structural steel for bridges and wrought carbon steel wheels for electric railway service.

It is interesting to note that the inspection of the test steel sheets at Fort Sheridan, Pittsburgh, and Annapolis shows additional failures among the non-copper-bearing groups of sheets, with no failures in any of the copper-bearing groups. It will be remembered that the term "copper-bearing" indicates a steel, otherwise of the ordinary commercial variety, which contains about 0.20 per cent of copper.

The above sheets are exposed to air and show the superiority of copper-bearing material under atmospheric conditions. Tests, however, of sheets completely immersed, some in city of Washington water and others in Calumet mine water, do not indicate any outstanding superiority for any one type of metal, and the presence of copper added to the various types of metal does not increase its resistance to corrosion when the samples are totally and continually submerged in running water of acid or alkaline reaction. The tests further show that the average life of the sheets immersed in water from the city of Washington supply to be about 18½ times longer than those immersed in mine water.

The sheets at Fort Sheridan exposed to air were first exposed in April, 1917. It should be noted that all the sheets in four groups of low-copper bessemer and open-hearth steel and pure iron have failed, and that of the total No. 22 gage non-copper-bearing sheets 50 per cent have failed, whereas none of the copper-bearing sheets has failed.

The society has undertaken a series of field tests on hot-dip galvanizing, sherardizing, electro-zinc plating, zinc coating by spraying, cadmium plating, calorizing, chromium plating and terne coating. Sheets of No. 22 gage basic open-hearth steel, without copper, are to be exposed, and, in addition, castings of an approved form, made of both cast and malleable iron.

Wire test specimens of material to be determined by further consultation with the coated-wire industry are to be included in the test. In all cases uncoated control pieces are to be exposed.

New England Club Honors Past-Presidents

Badges Presented to Twelve Former Executives at 25th Anniversary Dinner—Mr. Shannahan Tells Plans of American Association—Officers Elected for Ensuing Year

The New England Street Railway Club celebrated its 25th anniversary with a dinner held the evening of March 26 at the Copley Plaza Hotel, Boston. More than 500 were present. The feature of the evening was the presentation of badges to twelve of the 24 past-presidents of the club. These included H. E. Farrington, H. C. Page, W. D. Wright, Thomas Lees, Elton S. Wilde, John T. Conway, Clark V. Wood, R. W. Perkins, I. A. May, Edward Dana, Ralph D. Hood, and the retiring president, T. H. Kendrigan. In a humorous address C. C. Peirce of the General Electric Company, who acted as toastmaster, gave a brief history of the club and said that the members, principally the manufacturers, had felt that a fitting remembrance should be given to the presidents who had labored so faithfully for its success.

In his presidential address Mr. Kendrigan gave a review of the events of the past year and the progress that had been made by the club in that period. He was followed by the president-elect, L. D. Pellissier, who spoke briefly of his appreciation of the honor conferred upon him.

President John N. Shannahan of the American Association, the speaker of the evening, told of the work of the association and events which led to the appointment of Mr. Storrs as managing director, as well as of some of the problems now confronting the industry. An abstract of Mr. Shannahan's address is given elsewhere.

Mr. Storrs responded briefly, telling of the aims of the association and the responsibilities of the new arrangement.

Mayor Curley of Boston gave an interesting talk on the relations existing between the Boston Elevated Railway and the city. He expressed great satisfaction at the results which had been obtained by public control, and said that he was desirous of continuing the arrangement for a full twenty-year period. An abstract of Mayor Curley's talk appears elsewhere in this issue.

Following the addresses a vaudeville program entertained those present.

ELECTION OF OFFICERS

At an afternoon meeting officers for the ensuing year were elected as follows:

President: L. D. Pellissier, Holyoke, Mass.

Vice-presidents: H. F. Fritch, Boston, Mass.; J. K. Punderford, New Haven, Conn.; J. B. Crawford, Concord, N. H.; T. B. Jones, Burlington, Vt.; F. D. Gordon, Portland, Me.; E. A. Brown, Newport, R. I.

Secretary: J. W. Belling, Boston, Mass.

Treasurer: Fred F. Stockwell, Cambridge, Mass.

Executive Committee: W. W. Field, Cambridge, Mass.; C. H. Wood, Boston, Mass.; G. H. Martin, Boston, Mass.; H. M. Flanders, Springfield, Mass.; H. H. Hanson, Newtonville, Mass.; R. B. Stearns, Boston, Mass.; J. P. Alexander, New Haven, Conn.

Broadening the American Electric Railway Association's Work*

Changing Conditions and Problems of the Industry Call for Greater Service from the Association—Appointment of Mr. Storrs Opens Up New Field of Endeavor

By J. N. Shannahan
President American Electric Railway Association

ONE of the features of the electric railway business that keeps us fellows in it and draws in the younger men is the fascinating effect of change. The transportation industry is in a continuous state of evolution. I don't need to remind you men of the changes that have come in the last 30 years. These continual changes in the demand of the public for transportation service have kept transportation men on the jump. They make our work intensely interesting. They fill our lives with difficulties and troubles, but we do not break down under them—we try to meet each situation as it arises and give the public the best that is in us.

Speaking for myself, I think that perhaps our greatest fault is that we have been too prone to see only the things in our own back yards. We have gone about individually, studying our problems and doing our best to meet them. A great many times some of our neighbors have had similar difficulties and have come through them successfully, but we have paid little attention to what the other fellow did.

You all remember that it took a crisis to bring about collective action on our part in 1919. At that time the industry was in a bad way. We had been compelled to meet the increasing cost of materials and labor and had been prevented from increasing our income. President Wilson appointed the Federal Electric Railways Commission and before it appeared representatives of our industry from all parts of the country. For the first time in our history the public was informed of the facts concerning the street railway business. Since the Federal Electric Railways Commission made its report there has been a marked improvement in public understanding. Since then the financial condition of the industry has improved greatly. I believe that the service we are rendering is better, but, gentlemen, we have not yet rung the bell, and I don't believe that we will until you men in Massachusetts realize that success in our business depends in a large measure upon the successful conduct of the public transportation business in every other part of the country, and until the railway men in other parts of the country get it into their minds that their success is in a measure dependent on your success. I believe it was Patrick Henry who said something to the effect that if "we don't hang together we will hang separately," and another well-known quotation is that a house divided against itself cannot stand.

Now, we have made good progress at getting together, but we haven't gone as far as we must. The American Electric Railway Association, of which I have the honor to be president, represents about 90 per cent of the electric railway mileage in the country. In 1924 the electric railways of the country carried some 16,000,000,000 passengers. This was an increase of nearly 1,000,000,000 over the number carried in 1923, and this in the face of a tremendous increase in the number of automobiles. The American Electric Railway Association has done its best to inculcate a spirit of progressiveness in the minds and hearts of its members. It has encouraged and assisted member companies to carry on public relations work; it supplies them with a large amount of information on operating problems; through its various committees it is rendering a service that is of inestimable value to you. But there is a point beyond which the association cannot go. It cannot deal with questions of management, questions of relations between the individual members and the public they serve, questions of policy with reference to local conditions. It can and does reflect the opinion of the industry as a whole in its announcements and the recommendations that are made at its conventions, but these have not always been adequate to meet a given problem.

Better Off, but Still Some Troubles

While as an industry we are better off financially and otherwise than we were in the bad old days of 1919, we are still having our troubles, and they are not altogether of our own making. You don't have any interurban railway lines in New England that are comparable with those in the Middle West, where the hauls are long and the lines are paralleled by state highways, over which in many states unregulated motor vehicle competition has been rife. Within the last four months two of the largest interurban railways in the country have been forced into receivership, largely because the public had not recognized the essentiality of the service rendered. Several legislatures now in session have enacted laws which will help to preserve to the public the service that is indispensable, but many of the railways have suffered damage that is very serious, and it will be some time before some of them will have completely recovered.

It has been in the minds of some of us for a long time that a way must be found to render the electric railways greater service than can come through routine association activities. This thought led to the suggestion that there should be a committee or council of men representing not only the operators of the electric railways, but also the owners of them, this council to give its best thought and advice toward leading the industry to permanent prosperity. Acting on this suggestion there has been created what is known as the Advisory Council of the American Electric Railway Association. These gentlemen quickly determined that to work out their ideas and policies they needed the services of a man who would have the whole-hearted respect of every electric railway man in the country, who would have those personal qualities that make a man attractive, whose technical knowledge would make his advice authoritative, and whose vision would be so broad as to make it possible for him to see into the future. I am happy to say that one of your members was chosen for this position—Lucius S. Storrs. Mr. Storrs will assume the position of managing director on April 2. He will give his entire time to the problems that confront us. He is at your service, whether you operate in New England, in Kansas, in California, or wherever you may be. You can talk to him as a brother and he will talk the same way to you. He knows the public transportation business from "A" to "izzard" and I know that nothing will give him greater pleasure than to feel that he can be of real service to you.

Storrs Appointment Indorsed

Since the announcement of the appointment of Mr. Storrs was made at our Midyear Meeting in Washington, I have received scores of letters and telegrams indorsing the action of the association. The feeling is general that this is the most important step the industry has ever taken. We believe it is, but let me say now that the accomplishments of the Advisory Council and of Mr. Storrs will be measured entirely by the co-operation which they get from the electric railway interests. Every electric railway company in the United States and every manufacturer of goods which are used by electric railways should give the council and Mr. Storrs their whole-hearted support, both moral and financial.

A few minutes ago I said that our industry is continually changing. With its evolutions there come new problems, not only in the practical operating of our business, but in matters concerning regulation and legislation. All of us are in a measure feeling our way. We find the public demanding motor vehicle transportation, and we also find that if we do not meet that demand somebody else will. The jitney hit us a hard wallop, and by the time the public had discovered that jitney competition was more ruinous to its own interest than it was to the electric railway, although we all know it did much damage to us, there had developed the bus.

Now the bus is merely a new tool for electric railways to use wherever it will fit best. I do not mean to say that you men should put on a lot of buses in response to clamor from a noisy minority and run those buses under conditions and on fares that will not return a profit to you—not at all; but I do believe that where bus service can be rendered with profit to the public and to the railway company, it is in the interest of the public that the railway company should run the buses. Only surveys of local territory by competent persons will determine whether and how buses should be run, but once the decision to run them is made it devolves upon the electric railway management to see that the same care is taken to maintain schedules and to render service that is characteristic of their rail lines.

---

*Abstract of an address at the annual dinner of the New England Street Railway Club, Boston, Mass., March 26, 1925.

And in that connection there arises the question of protection of the established rail and bus lines against unfair competition. Massachusetts is one of the very few remaining states in the Union that have neglected to give the railways the protection to which they are entitled. You were one of the first states to establish the principle of state regulation of public utilities. But Massachusetts has been slow to protect the railways which it regulates. Unless your Legislature has acted within the last few days, you have no law authorizing your Department of Public Utilities to determine whether public convenience and necessity calls for the establishment of highway motor vehicle lines that would compete with steam and electric lines. Certainly such authority should be given your public utility regulatory body. It is obviously in the public interest.

HIGHWAY INTERSTATE COMMERCE

In many ways the attitude of New England toward the electric railways has been progressive and enlightened. Here you have recognized that the investors are entitled to fair pay for the work their money is doing for the public. Here in Boston and in most of your large communities you have found the 10-cent fare to be necessary and your people recognized the justice of it. Under the public trustee acts, under which the Boston Elevated and the Eastern Massachusetts systems operate, the return to the investors is limited to 6 per cent, certainly a small enough return. Yet there are many companies that are not earning even 6 per cent, though they are rendering service that is as vital to the prosperity of the communities as the air we breathe.

Because of the dense population of New England, the closeness of your important communities to each other and the wonderful system of highways that has been developed by your states, and the close relations of the people in the different communities to each other, there has developed in the last two years an interstate motor vehicle business that has reached considerable proportions. Under the decision handed down by the United States Supreme Court on March 2, the states are without power to regulate this interstate business except so far as the safety of the public and the preservation of the highways themselves are concerned. As matters stand the states cannot deprive anyone of the right to operate interstate highway vehicles for hire, nor can the states regulate the rates of fare to be charged nor the quality of the service to be rendered. The coming summer may see your highways filled with vehicles competing not only with the steam and electric lines, but with bus lines which had been established in response to public demand, and which are subject to state regulation.

There can be no doubt in anybody's mind that this situation cannot continue without tremendous damage being done to the interests of the people on the one hand, and to the interests of all regulated common carriers on the other. It seems to me, and I feel sure it is the belief of others who have given the subject any study, that the Interstate Commerce Commission, perhaps jointly with the state commissions, should be empowered by Congress to exercise regulatory powers over interstate highway carriers. The Interstate Commerce Commission can be relied on to protect the public interest. Its long experience has given it understanding of the place which the various agencies of transportation occupy in the life of the communities. Before this authority can be given to the Interstate Commerce Commission, or anything can be done to increase the jurisdiction of the state commissions by Congress, however, there probably will be a great deal of harm done to the established rail and bus lines. This, of course, is extremely regrettable, and we all must hope that the condition will be remedied as quickly as possible.

◆

Results with Public Control*

The Agreement Between the State of Massachusetts and the Boston Elevated, Made in 1918, Has Proved a Wise One and Should Be Extended for Twenty Years

By HON. JAMES M. CURLEY
Mayor of Boston

IT HAS been my very great pleasure to associate during the past 24 hours with the guest whom the street railway men are tonight honoring, and whom the city of Boston esteems it an honor to have within its gates, President Shannahan. Through his courtesy to me, and that of the presiding officer, I am permitted to come here and say just a word.

We are very proud of the officials in charge of our street railway transportation system. I am deeply in sympathy with their efforts to turn an annual deficit into an annual profit, because they owe us $1,700,000, and we could use the money.

At no time during the evolution—or revolution period, if you will—of street railway transportation has the public of New England, or that portion represented by the city of Boston, had a better realization or a more true perspective of the value of street railway transportation to the development of the community, or looked upon it with a more kindly spirit or a greater desire to be of assistance, than at the present hour.

What was deemed revolutionary in 1918 with reference to the Boston Elevated System is now regarded, after the passage of seven years, as the wisest character of legislation, and a plan that might be tried with profit by every section of the entire United States of America.

We gave them a peculiar charter in 1918. We have permitted a concern which was almost on the verge of bankruptcy to go before the General Court and receive a warrant which permitted it to charge any rate of fare which it saw fit, and in the event of its inability in any year to meet its expenditures in operation and the payment of its dividend, to assess its deficit on the cities and towns in which it operates.

It rather savored of the old days when what is now Manhattan was exchanged for a string of glass beads, but we feel that it has been a wise investment and the Boston Elevated System is now before the Legislature seeking further legislation, and two propositions are being considered—one the question of direct ownership by the cities and towns through which the road operates, which at a recent hearing had but one supporter to the project, and the other an extension of the franchise granted in 1918 for the period of twenty years. It is my firm belief that the Legislature in its wisdom will reject the proposal for a year's further study of the project, and, recognizing the need of adequate railway transportation, will grant an extension of the existing franchise for a further period of twenty years.

The whole public attitude with reference to street railway transportation has undergone a transition, if you will, during the past three years. We are beginning to realize that the competition of motor buses has been a serious competition in cities outside of Boston, and would have been a serious competition in Boston were it not for the fact that the Mayor of Boston recognizes that a street railway transportation corporation cannot do business on good wishes and promises, and that it requires something more substantial than it is possible to develop with outside competition which will operate only when the sun shines and roads are in good condition, and the remainder of the year compel people to use that which God gave them as a means of locomotion, before the birth of Henry Ford.

So we are taking a different view of the proposition. Our perspective has been broadened, and we are beginning to appreciate that street railway transportation has passed the stage of a non-essential; that it is an absolute essential for the conduct of business activity, and for the convenience of those members of the public who either find it impossible to own a car, or have difficulty in retaining in their service men who are competent to operate cars. And, taking that view of the proposition, we do not believe that it is a violation of the law, and we do not believe that it is bad judgment, to consider it in the same light as we do other essentials to the development of the prosperity and the happiness of society, such essentials as water, public sewerage, public lighting, public health, and public education.

---

*Abstract of an address at the annual dinner of the New England Street Railway Club, Boston, Mass., March 26, 1925.

We realize that no one individual, unaided, can maintain a personal transportation system of his own, and considering it in the main essentials we recognize that it is necessary, when support from its patrons is insufficient to meet the cost of operation with a reasonable return to the investors of a street railway transportation system, to make direct levies on the taxpayers for the maintenance of that institution, and contribute the money to the street railway companies that are operating in the community. So that it is a great pleasure to me, as the Mayor of a city which has considered with some intelligence and with some degree of generosity its street railway transportation, to come before you men and express the wish, aye, the hope, that the same intelligent direction and the same generous spirit which have made possible the continued existence of the Boston Elevated transportation system, will be in evidence before the 26th banquet of this organization in every intelligent community in New England, and that means every city and town in all New England.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 9—Central Electric Railway Master Mechanics' Association, Hotel Keenan, Fort Wayne, Ind.

April 16—Wisconsin Utilities Association, Hotel Pfister, Milwaukee, Wis.

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Electrical Night at N. Y. R.R. Club

AT THE second "electrical night" meeting for the season of the New York Railroad Club, held on March 20, William B. Potter, chief engineer railway department, General Electric Company, spoke on "The Latest Developments in Electric Locomotive Design." The main floor of the auditorium of the United Engineering Society's building in New York City was filled to capacity, indicating keen interest in recent developments in electric motive power.

Electrification Progress

Mr. Potter said, first, that while electrification of steam railroads had not come about as rapidly as had been hoped for, substantial progress had been made. He quoted data from the recent report of the statistical department of the Chicago, Milwaukee & St. Paul Railway, showing substantial savings from the electrification. (See ELECTRIC RAILWAY JOURNAL for Feb. 28, 1925, page 338). The electrification was, therefore, not responsible for the railroad's recent financial difficulties. He also touched briefly upon recent foreign electric locomotives, particularly with reference to the problems involved in the use of siderods, which are popular abroad. Pictures of an experimental type of geared drive, with the gears outside the bearings, were shown on the screen as an example of recent studies in the line of simplification. The utilization of electric motive power, said Mr. Potter, should be along lines of the natural characteristics of this motive power, not along steam locomotive lines. Perhaps the electric locomotive of the future will be more like the trolley car, with bogie trucks, rather than like a steam locomotive. He showed pictures of locomotives recently supplied for operation in Mexico, between Vera Cruz and Mexico City, where regeneration is an important factor. Reference was made also to the type of locomotive being built for the New York, New Haven & Hartford Railroad, on which 600-volt direct-current motors will drive the axles. A motor-generator set will convert the 11,000-volt, single-phase alternating current into direct current.

Gasoline and oil engines were regarded by Mr. Potter as bound to play an important part in transportation in the future on account of their high efficiency. With these engines the rail car offers an opportunity to save operating expenses on lines of light traffic, and the bus has its place also. Electric speed reduction is preferable to mechanical in such vehicles, on account of its flexibility.

In conclusion, Mr. Potter explained the construction of the "otheograph" (see ELECTRIC RAILWAY JOURNAL for Aug. 25, 1923, page 294), by means of which the vertical and lateral stresses in track can be recorded as locomotives and cars pass over it at any desired speed.

Radio for Railways

Mr. Potter was followed by G. Y. Allen of the Westinghouse Electric & Manufacturing Company, who, speaking on "Radio on Railways and Elsewhere," described the principles of "wired wireless," in which power lines can be used for telephone transmission without interfering with their main function. Direct application to railroading has been slow due to the demand for radio apparatus in other fields, but transmission of signals from end to end of long freight trains on electrified railroads has been developed.

H. H. Vreeland, Elisha Lee and D. M. Brady then spoke briefly on the value of membership in the club, and a high-class vaudeville entertainment followed. There was no discussion of the technical papers. Refreshments were served at the close.

The program was in charge of a special committee consisting of W. G. Gove, chairman; J. S. Doyle and H. H. Norris.

Central Association to Meet at French Lick

THE annual summer meeting of the Central Electric Railway Association will be held at French Lick Springs, Ind., on June 2, 3 and 4. Arrangements are under way to assure a profitable and enjoyable meeting. A program of the business sessions will be published when completed.

Special rates have been made by the hotel company. The amusement facilities of French Lick include two eighteen-hole golf courses owned by the hotel company. Natural surroundings also offer an excellent opportunity for hiking, horseback riding and other outdoor sports. A swimming pool is included in the facilities. A large room in the recently completed addition to the hotel is available for light exhibits of manufacturers who may desire to send samples of equipment to the meeting.

Reservations should be made directly with the hotel company.

Internationaler Strassenbahn und Kleinbahn Verein

THE Internationaler Strassenbahn und Kleinbahn Verein (Street and Interurban Railway Association of Central Europe) will hold its next annual meeting June 21-25, 1925, at Budapest. The twelve subjects announced for discussion are as follows: "Railways in Hungary"; "The von Kando Alternating-Current Locomotive"; "Schedule Speeds on (a) Street Railways, (b) Interurban Railways"; "Recent Developments in the Design and Construction of Automatic Substations"; "Electrically Welded Rail Joints"; "Thermit Joint Welding on Exposed Track"; "Design and Operation of New Types of Street Railway Cars"; "Safety Precautions at Grade Crossings, at Which There Are No Flagmen"; "Developments in Internal Combustion Engines for Independent Units on Interurban Railways"; "Different Methods of Securing Economy in Suburban Rail Service"; "Present Status and Recent Developments in Construction and Operation of Auto-Motor Cars (a) for City Service, (b) for Interurban Service"; "Effect of the Auto Bus on the Street Railway."

Second Regional Motor Conference in May

THE second regional motor transportation conference under the auspices of the National Automobile Chamber of Commerce is announced for Chicago on May 26-27. The main theme, as in the first conference in Boston, will be the co-ordination of bus and truck uses with railway facilities.

Central Master Mechanics' Program

THE next regular meeting of the Central Electric Railway Master Mechanics' Association will be held at Hotel Keenan, Fort Wayne, Ind., commencing at 9 a.m., Thursday, April 9.

The program will include a talk by a steam railroad representative on interchange rules, reports of committees, and such other business as may be properly presented. There also will be a round-table discussion on matters of interest to the members attending. Some time will also be devoted to inspection of the shops of the local street railway.

American Association News

Mr. Storrs Takes Office

Railway Financing and Problems Arising from the Operation of Buses Will Receive Attention

LUCIUS S. STORRS, who recently was appointed managing director for the traction industry by the American Electric Railway Association, opened his office at 292 Madison Avenue, New York City, on April 2. Mr. Storrs, who is an executive of wide experience and particularly well known for his ability to deal with the public, will act largely as a general adviser and guiding hand for the electric railway interests, large and small.

Entrance of Mr. Storrs into the national electric railway situation is a part of the general modernization movement, according to a statement issued from association headquarters. Major problems facing the industry include co-ordination of electric railway and bus service, financing of extensions and betterments, and the procuring of legislation for the regulation of interstate bus traffic. Adoption of the bus as an integral part of electric railway service is becoming general throughout the country. At present about 200 electric railway companies are using the bus in supplemental service. In further co-ordination of bus and electric car service, Mr. Storrs' advice will be valuable. As president of the Connecticut Company, which operates practically all the electric lines and many buses in Connecticut, he had long experience with bus service. Ever since the bus began to occupy a place in local transportation, Mr. Storrs has been actively associated with joint committees of the automotive and electric railway groups.

Financing is occupying a prominent place in the traction picture now. Prior to his entrance in the electric railway business, Mr. Storrs was president of the New England Investment & Securities Company, and also now is a director of the Union Trust Company of Springfield, Mass. After becoming associated with the Connecticut Company he successfully financed that property despite the general gloomy attitude entertained by bankers regarding tractions.

The interstate bus situation is probably the most pressing immediate problem that Mr. Storrs must face. It was brought to a climax by the recent decision of the United States Supreme Court which put the determination of the convenience and necessity of interstate lines beyond the power of the state commissions. The Interstate Commerce Commission having held that it has no authority for highway transport, there now appears to be no regulatory authority controlling buses. Any relief which is effected probably will have to come through Congress, and doubtless legislation will be sought by the various interested industries.

Exhibits

SEVERAL of the members of the convention committees on exhibits and entertainment held a preliminary meeting at Atlantic City on March 20. Members present were: C. E. Morgan, chairman exhibit committee; S. J. Cotsworth, chairman entertainment committee; J. W. Welsh, executive secretary; F. C. J. Dell, director of exhibits; J. C. McQuiston, A. J. Purinton, A. M. Robinson and L. W. Shugg. Mayor E. M. Bader of Atlantic City and representatives of the local interests were also present. Satisfactory arrangements were concluded for the use of Young's Million Dollar Pier and for the decorations and other arrangements.

An innovation has been made this year by arranging for the construction of a temporary railroad track so that electric cars can be placed on exhibit without the difficulties of transportation to and from the pier that have been encountered in past years.

It was recommended by the exhibit committee that Wednesday, Oct. 7, be set aside for the inspection of exhibits, the same as the corresponding day last year. It was also recommended that the association look with displeasure on any exhibit or demonstration of buses elsewhere than on the pier.

A sub-committee was appointed to assist in securing exhibitors, as follows: Morris Buck, chairman; T. W. Casey, L. W. Shugg, B. E. Tilton, New York district; A. M. Robinson, S. J. Cotsworth, Philadelphia district; Thomas Fitzgerald, J. C. McQuiston, Pittsburgh district; A. L. Price, R. C. Snell, Cleveland, Detroit and Toledo districts; H. H. Adams, J. R. Fitzpatrick, L. E. Gould, Chicago district; G. L. Kippenberger, St. Louis district; R. H. Dalgleish, Washington district; H. B. Potter, Baltimore district; G. H. Clifford, Southern district.

Other sub-committees appointed were: Decorations—J. C. McQuiston, chairman; L. W. Shugg, F. C. J. Dell; space—H. B. Potter, chairman; L. E. Gould, G. H. Clifford; power—T. W. Casey, J. R. Fitzpatrick, A. L. Price; car and bus exhibits—A. J. Purinton, chairman; S. J. Cotsworth, R. H. Dalgleish, G. L. Kippenberger, A. M. Robinson; insurance—J. W. Welsh, F. C. J. Dell; co-operation with entertainment committee—Morris Buck, chairman, H. H. Adams, B. E. Tilton.

Equipment

A MEETING of the equipment committee of the Engineering Association was held in Cleveland, Ohio, on March 16 and 17. Those present were: P.V.C. See, chairman; W. S. Adams, R. S. Bull, A. T. Clark, L. H. Fry, J. M. Hipple, W. H. McAloney, J. C. McCune, M. O'Brien, E. S. Sawtelle, W. G. Stuck, H. S. Williams, G. L. Schermerhorn representing E. D. Priest, Robert Long representing J. L. Gould, and D. C. Fenner and J. S. McWhirter, visitors.

In connection with the review of existing standards, the committee considered it desirable to give further attention to the matter of clearances for bearings, in order that these might be definitely specified. The specifications for proof-testing of forgings as submitted by sub-committee No. 1 were approved. In regard to wheel mounting and check gages, it was decided to recommend two gages, one for mounting wheels and the other for checking the gage of wheels after they are mounted. The mounting gage is to be made up without tolerance, and the checking gage with tolerance. The present standard gage should be revised to change the slope of the wheel tread from 1 in 25 to 1 in 20. The suggestion that a gage be made up to determine when wheels should need further attention was disapproved. Questions of proper tolerance for bore of gears and the revision of plain gages for wheels and permissible eccentricity of axles were discussed, and it was decided that further information should be obtained.

The sub-committee on brakes and foundation brake rigging made a very complete report. This included definitions of the various brake equipment parts, methods and formulas for computing stresses in foundation brake gear, frequent causes for poor braking conditions and recommended practices for overcoming troubles. This was reviewed and several changes were suggested. The sub-committee will revise this report and submit it for further consideration. Car painting was discussed and the committee on this subject reported that a questionnaire had been sent out. As soon as replies are received, these will be tabulated for further consideration.

The minutes of a meeting of the motor coach committee of the Society of Automotive Engineers, held on March 9, were read and the members of the equipment committee decided to cooperate in the work as outlined.

The subject of reduction of car noise was reported on by the sub-committee, and discussion of the work brought out the fact that certain tests were desirable. In order to carry out the tests properly, instruments and various testing equipment would be needed. The committee decided to recommend that the subject of tests in connection with car noise be referred to next year's equipment committee with the recommendation that an appropriation be made to cover the cost of instruments necessary for making the tests.

to be used in making the various tests. The committee reported that a questionnaire had been prepared and would be sent out.

Reports of the chairman of the various sub-committees brought out the fact that members have been delinquent in answering correspondence, so that many reports have been held up, awaiting replies. More prompt attention is necessary if the large amount of work assigned to the committee for this year is to be completed.

Rapid Transit

THE first meeting of the rapid transit committee for the year 1924-1925 was held at association headquarters, New York City, on March 27, with the following members in attendance: G. A. Richardson, chairman; J. H. Alexander, C. E. Smith, D. L. Turner, James Walker, R. B. White and W. B. Bennett.

A discussion of the objects of the committee was followed by a discussion of its activities during the previous year. It was pointed out that a start was made last year in the compilation of statistical and historical data covering the principal cities in the United States and in foreign countries in which rapid transit facilities are in operation; and also similar data for those cities in the United States whose populations have reached a point where rapid transit facilities either have been under consideration or may in the near future be under consideration. It was agreed that this information would be of incalculable value in studying rapid transit developments to date and in furnishing information for guidance in the near future.

Mr. Walker, who compiled this data, stated that some companies had not responded in furnishing the information requested. After considerable discussion it was the consensus of opinion that an attempt should be made immediately to arouse the interest of those companies with a view to securing their co-operation in furnishing the desired information. Mr. Richardson suggested that Mr. Storrs personally write to the executives of the companies in cities of 500,000 population or more, pointing out to them the value of the work this committee proposes to do, and thereby attempting to secure their co-operation in furnishing the necessary data. This letter is to be accompanied with a questionnaire outlining the data desired.

The following subjects were discussed as being worthy of consideration and possibly of inclusion in the final report:

Forms of rapid transit other than elevated or subway for cities having populations from 500,000 upward. It was pointed out that in some instances street widening would permit the construction of tracks in a ballasted central portion either with or without grade crossings, depending upon the particular local conditions. On such tracks a form of express service might be operated which would result in very much higher schedule speeds than are possible at present on surface lines under ordinary conditions. Such construction could readily be made with a view to the later installation of elevated or submerged tracks when traffic conditions warrant the additional investment.

Possibilities of materially increasing schedule speeds on ordinary surface lines by strict police regulation of traffic designed to keep the tracks clear of other vehicular traffic during the rush hours.

Methods of financing rapid transit facilities, i.e., whether or not such facilities should be constructed with private capital by general taxation in the community, by assessment against abutting property (the value of which would be greatly enhanced by the rapid transit facilities) or by combinations of any of these methods.

Enhanced value of property resulting from the installation of rapid transit service in the community.

The general discussion covered many phases of rapid transit service, including the use of motor buses as feeders to rapid transit lines. There was unanimous agreement that all facilities of whatever kind should be co-ordinated into a single unified system in the interest of the community served.

Two Convention Committees Named

THE personnel of two important convention committees, those on exhibits and entertainment, has been completed and was announced recently by President Shannahan. The complete list of names follows:

EXHIBITS

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, Brooklyn, N. Y., chairman.
H. H. Adams, Chicago, Ill.
Morris Buck, New York, N. Y.
T. W. Casey, New York, N. Y.
G. H. Clifford, Fort Worth, Texas.
S. J. Cotsworth, Philadelphia, Pa.
R. H. Dalgleish, Washington, D. C.
Thomas Fitzgerald, Pittsburgh, Pa.
J. R. Fitzpatrick, Chicago, Ill.
L. E. Gould, Chicago, Ill.
G. L. Kippenberger, St. Louis, Mo.
J. C. McQuiston, East Pittsburgh, Pa.
H. B. Potter, Baltimore, Md.
A. L. Price, Mansfield, Ohio.
A. J. Purinton, Atlantic City, N. J.
A. M. Robinson, Philadelphia, Pa.
L. W. Shugg, Schenectady, N. Y.
R. C. Snell, Cleveland, Ohio.
B. E. Tilton, Syracuse, N. Y.

ENTERTAINMENT

S. J. Cotsworth, sales agent Lorain Steel Company, Philadelphia, Pa., chairman.
G. A. Barnes, New York, N. Y.
Carl H. Beck, New York, N. Y.
E. J. Blair, Chicago, Ill.
H. L. Brown, Mansfield, Ohio.
F. A. Elmquist, New York, N. Y.
E. C. Faber, New York, N. Y.
C. E. Hale, Pittsburgh, Pa.
J. W. Hancock, Roanoke, Va.
H. J. Kenfield, Chicago, Ill.
G. R. Lyman, New York, N. Y.
C. E. Morgan, Brooklyn, N. Y.
L. H. Palmer, Baltimore, Md.
W. C. Parker, Lansing, Mich.
C. L. Pierce, Jr., Pittsburgh, Pa.
Harry Reid, Indianapolis, Ind.
W. J. Stanton, New York, N. Y.

Engineering Symbols

A MEETING of the committee on engineering symbols was held at association headquarters, New York City, on March 30. Those present were: H. R. Stamm, chairman; R. C. Cram, sponsor; H. W. Codding, C. W. Squier and W. J. Quinn, representing J. F. Neild.

A large number of symbols were submitted by various members of the committee for consideration. These symbols were divided into six classes: (1) Topographical; (2) buildings and structures; (3) electrical; (4) railroad; (5) mathematical; (6) mechanical.

Topographical symbols used by the United States Geological Survey and by the committee on national defence maps were considered by the members in connection with those suggested in the Engineering Association Proceedings of 1915. As symbols used by the United States Geological Survey are printed in three colors, it was decided to use the symbols suggested in 1915, together with additional ones from the United States Geological Survey and committee on national defense maps, which could be shown in black and white.

Standard symbols for the electrical equipment of buildings as approved for a tentative American standard by the American Engineering Standards Committee were considered as satisfactory. Two sheets of architectural symbols were submitted for consideration. Symbols for heating and ventilating, as shown in a preliminary draft code of the American Society of Heating and Ventilating Engineers, were submitted, together with symbols used by several manufacturers of heating and ventilating equipment. It was decided to use those approved by the Society of Heating and Ventilating Engineers, together with any additions from the manufacturer's design, which were considered essential. A sheet of symbols on reinforced concrete, taken from the Structural Engineers' Handbook by Milo S. Ketchum, was submitted for criticism, together with symbols for structural mechanics taken from the same source. These were considered satisfactory by the members of the committee present, and they are to be sent to other members of the committee for consideration and criticism.

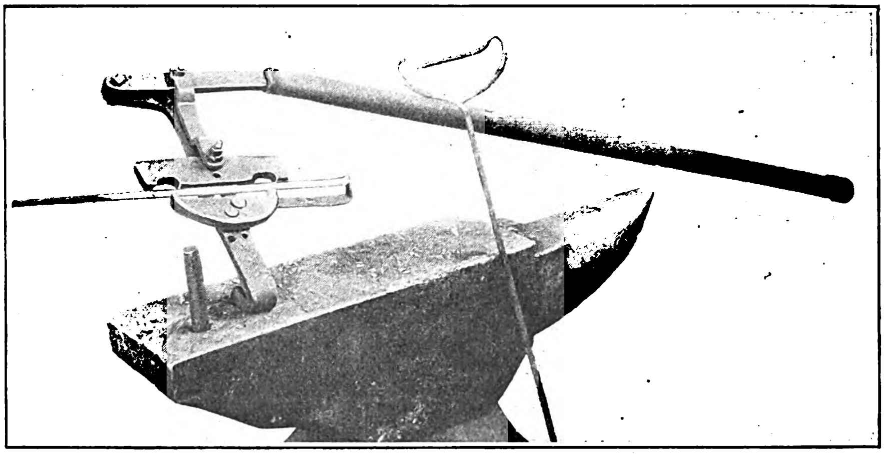
Several hundred symbols for electrical equipment were submitted for consideration. The number of these was reduced to approximately 75, which were considered essential for electric railway use. Sheets embodying these 75 symbols are to be prepared, and submitted for further consideration.

The symbols for track and rail as submitted in 1915 were considered satisfactory. These are to be supplemented by additional symbols which have been suggested as important to be incorporated in the report. Several sheets of symbols as used by the Railway Signal Association were submitted for consideration. These are to be sent to all members of the committee for their criticism and suggestion as to the ones which should be incorporated and for any modification, should that appear desirable. A sheet of mechanical symbols embracing desirable additions is to be prepared.

Maintenance of Equipment

Forming Handles at Ends of Iron Rods

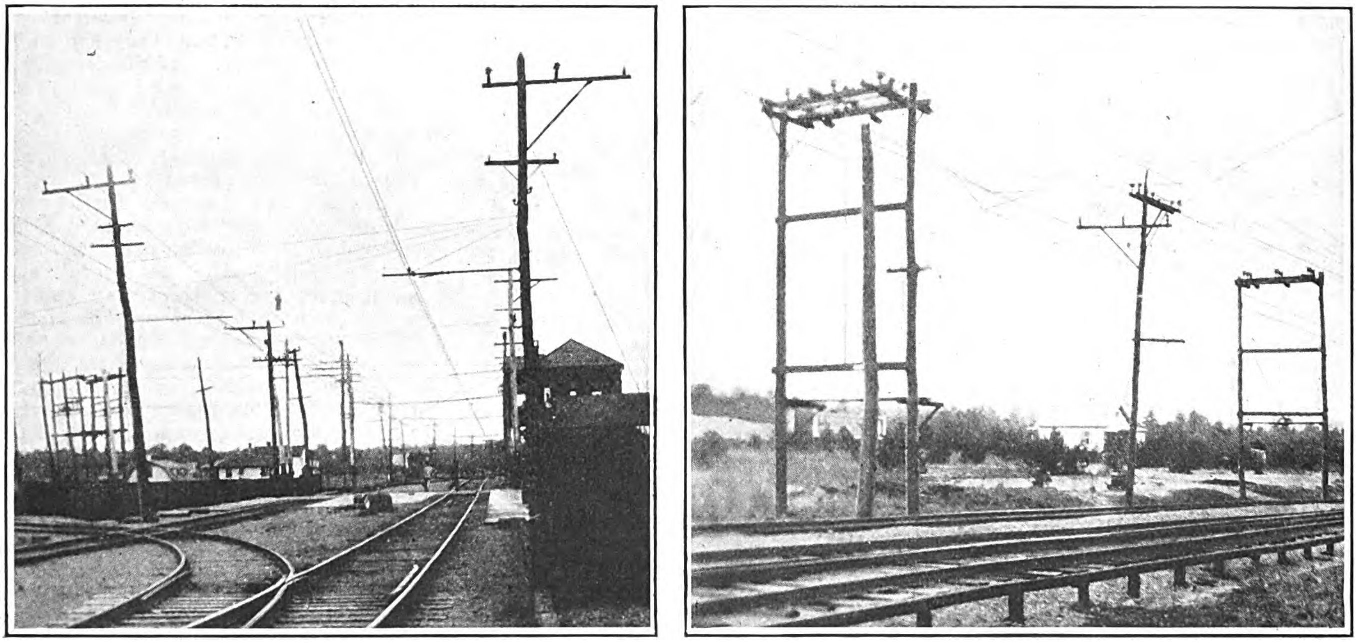
A CONVENIENT fixture for bending the ends of switch levers, underground conduit cleaning rods and other similar devices used by electric railways has been devised by C. P. Westlake, supervisor of equipment, Eighth Avenue Railroad, New York City. The supporting member of the fixture is arranged to fit into the hardie hole of the anvil, so that it is convenient to forge and tools. The part of the fixture used to bend the rod has two parts, one stationary and the other movable. The stationary part has the shape of the inside of the handle and the movable part when it is pressed down forms the upper portion. Pressure for the bending operation is obtained from a handle with fulcrum at the end acting through a link to the movable part. A pipe extension is used to provide necessary pressure through increased leverage.


Fixture Used for Forming Handles at the End of Rods

To bend the end of the rod into the shape desired, the end is heated at the forge and is then placed in the fixture with the end of the rod coming up against a stop, so as to determine accurately the amount of material to be used for the outside end of the bend. The movable part of the fixture is then pressed down by operating the handle, and the upper part is thus shaped. The long part of the rod is then bent down around the stationary part of the fixture, so as to form one side of the handle, and the short side of the rod is bent around the other side of the stationary fixture to make the complete handle. The accompanying illustration shows the fixture with a rod in position ready to start the bending. A completed rod with handle formed is also shown at the right. This is used for cleaning dirt out of the underground conduit.

Span Wires Replace Bracket Arms

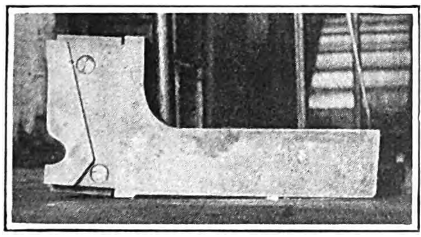
IN MAINTAINING its overhead lines, the Washington, Baltimore & Annapolis Electric Railroad has followed the practice of replacing the bracket arms from which the trolley wire is suspended by span wires, as shown in an accompanying illustration. From Baltimore to Washington this railway has double track and the overhead structure is supported by wood poles on both sides of the track. Catenary construction is used and $\frac{3}{8}$-in. hard steel messenger wire formerly was suspended


At Left, Old Arrangement with Messenger Wire Suspended from Bracket Arms. At Right, Messenger Wire Is Now Suspended Directly from Span Wires with Guys to Hold Trolley Wire in Position

from bracket arms extending over the track from the poles. Span wires acted as guys for the bracket arms and connected opposite poles. More recently the arms have been eliminated and the No. 0000 copper trolley and steel messenger wires are suspended by a triangular rigging as illustrated.

Finishing Wheel Tread and Flange at One Setting

STEEL-TIRED wheels are finished at the Unionport Road Shop, New York City, of the New York, Westchester & Boston Railroad with a tool accurately shaped to conform to the tread and flange contour. After the rough cuts are taken in the wheel lathe, this tool is used to finish the turning operation. It provides a very accurate contour and also saves considerable in the cost of turning.



Cutting Tool Used for Finishing Wheel Tread and Flange at One Setting

The cutting part of the tool is of tool steel, welded to a steel plate which screws to the end of the tool shank. This provides a renewable and removable cutting surface. At the same time it permits the use of a high quality of tool steel for cutting, with a lower grade material for the shank. An accompanying illustration shows the construction.

Accurately Fitted Bearings Have Long Life

THE use of plastic bronze for armature bearings instead of babbitt-lined cast-iron shells was begun in April, 1921, on the Utica lines of the New York State Railways. Particular attention was given to the boring of the new bearings, a clearance of 0.006 in. over the actual size of the armature shaft being allowed. After two years of service covering approximately 147,000 miles, the first car fitted out was brought in for a grounded armature. The bearings were examined carefully, and measurement showed a wear of 0.003 in. over the original clearance. Since the total clearance of 0.009 in. was not considered excessive the bearings were reinstalled and continued in service.

Bearings are bored on the same horizontal boring mill that is used for wheels. A special fixture has been designed which is capable of holding the two housings of the motor in a horizontal position. A boring bar of special construction is fastened to the spindle of the mill. This has a center bearing with micrometric adjustment to take up wear. Two bearings are bored in position at one time.

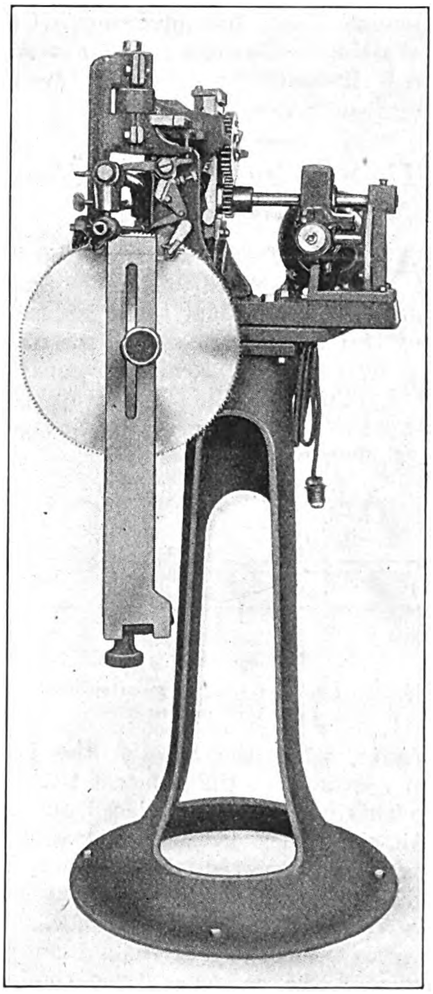
New Equipment Available

Circular Saw Filer

TO MEET the demand for an automatic machine to sharpen circular cross-cut and rip saws, the Wardwell Manufacturing Company, Cleveland, Ohio, has brought out a type known as the model Y. This has a capacity for filing all types of circular saws up to 18-in. diameter with teeth from the smallest up to ½ in. from point to point.

Among the special features of construction is the oblique elliptical movement of the filing arm, which gives the same stroke to the file as in hand work. A cam is connected to the main drive shaft. This cam raises the slide frame at a slight angle out of the vertical, which gives an oblique movement to the file and allows it to enter and leave any hook of tooth. A hardened steel roller on the point of the cam operates the horizontal slide filing arm. Two adjustments are provided for the movement of the lever attached to the swiveling head. One of these adjustments covers the length of stroke and the other the amount of cut removed from the face of the tooth. An elevating screw raises or lowers the saw at the point of filing.

The swiveling movement of the head and saw vise is secured through a 2 to 1 gear connection from the main drive shaft. The saw is turned alternately from right to left an amount depending on the degree of bevel to be given the teeth. The teeth of cross-cut saws are thus consecutively sharpened with alternate bevels through the swiveling of the saw between the stroke of the file. Ripsaws whose teeth do not require beveling are filed straight across by slipping the gears out of mesh and tightening the vise head in position at right angles to the file. The saw vise is easily removed for cleaning when necessary.



Combination Cross-Cut and Rip Circular Saw Filer Mounted on Pedestal

The machine can be furnished either for belt drive or with a direct-connected motor mounted on a pedestal. The bench type machine weighs 165 lb. When mounted on a pedestal, the weight is 315 lb. The machine can be operated at a speed sufficient to sharpen 65 teeth per minute. Standard triangular files are used of a size depending on the size of the teeth to be sharpened. These files can be used for their entire length and on all three sides.

Crane Control

A DEVELOPMENT that is of value where reversing and non-reversing direct-current motors are used is the new magnetic time controller marketed by the General Electric Company of Schenectady,

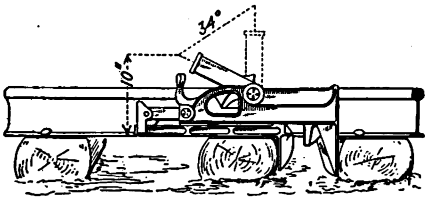
N. Y. This control has been especially designed for use with cranes and hoists.

Among the advantages claimed are ease in repair, well constructed and easily accessible parts, simplicity in wiring and a strong angle iron frame on which the control is mounted. Bases are moisture resisting, being constructed of a strong compound and chosen for their dielectric strength.

A time limit scheme of acceleration is provided when starting and current limit for plugging when reversing. Controls are provided with instantaneous electrical reset overload relays.

Tie-Spacing Cap and Shoe for Jacks

A CAP and shoe which can be instantly applied to Simplex track jacks, so as to adapt them for spacing ties, is being placed on the market by Templeton, Kenly & Company, Ltd., Chicago, Ill. To straighten skewed ties, the toe of the tie-spacing shoe engages the tie below the center, while the base of the jack presses against the adjacent tie.



Spacing Cap and Shoe in Position on Track Jack for Spacing Ties

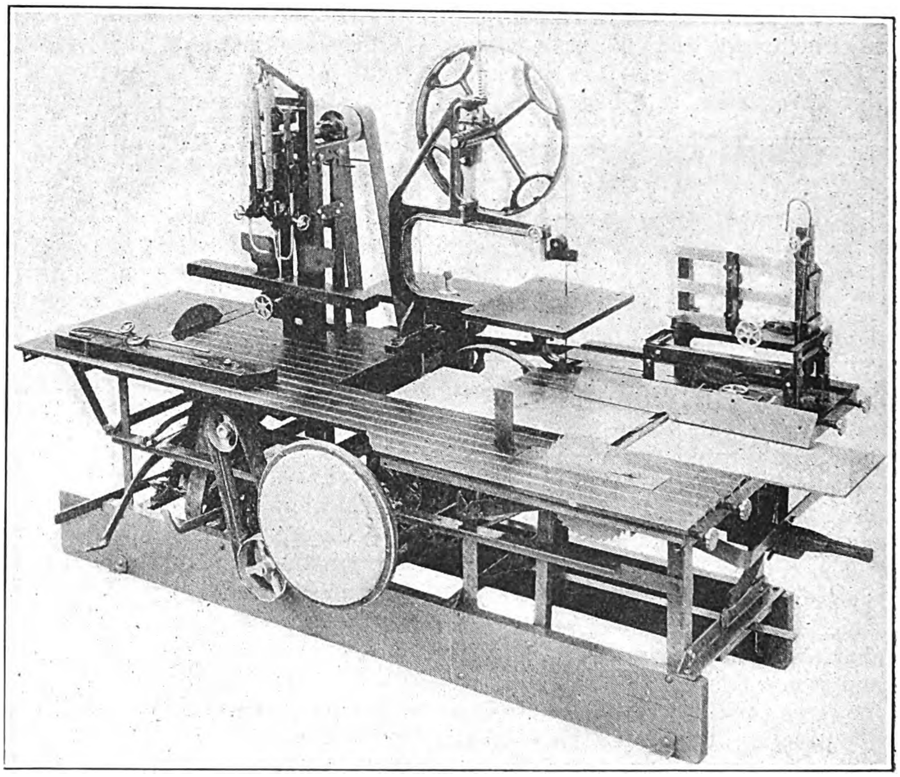
This device can be placed on any Simplex track jack. But two new parts are required, the cap and the shoe. The cap is a drop forging and is recessed to hold the shoe. It serves the purpose of the old cap by keeping the rack bar from coming out and also provides the shoe attachment. A greater safety feature is provided in the new cap by reason of its rounded edge and the downward projection which prevents the fingers from being pinched.

The tie-spacing shoe is a drop forging. It can be adjusted so as to give two positions of the toe. When adjusted in either position it does not swing away from the jack, nor can it drop out.

To use the new attachment for spacing ties, the ballast is removed ahead of the first tie and the jack and toe are placed in position. After the first tie has been spaced the others can be pushed ahead without removing additional ballast.

Combination Woodworking Machine

A COMBINATION working machine manufactured by the Parks Ball Bearing Machine Company, Cincinnati, Ohio, is designed to provide practically all of the more important wood-working machine tools in one piece of equipment at a very low price. The machine is built up on a steel frame made of 2-in. angles and is supported on two base timbers of 2-in. x 10-in. material, 8 ft. long and set 2 ft. apart. The circular saw table has a double working surface made up of channel slats welded to the angle frame. This table is 3 ft. 8 in. wide and 3 ft. long. The distance between saws is 28 in. A positive and accurate adjustment of the depth of cut is provided by the mandrel control device. These mandrels will take saws with a 1-in. hole and are stopped and started with a friction clutch.



This Machine Has Ten Wood-Working Tools Combined in a Single Mounting

A 12-in. wide joiner is provided, with a round safety head and four knives. The cutting circle is 4½ in. diameter. The steel plates are raised or lowered on an incline with hand wheel screws to adjust the depth of cut. A tilting guide on the joiner tilts to an angle of 45 deg. and is adjustable up to 17 in. width. A spring holds down the material.

At one side of the frame a band saw is mounted, which cuts to the center of a 44-in. circle. The band saw table measures 14½ in. x 17½ in. and can be tilted for sawing bevels. The wheels take saws 12 ft. long and the upper guide can be raised to take material up to 7 in. thickness. A belt-shifting device is used for convenience of the operator in stopping and starting.

There is a swing cut-off saw, which will cut 1-in. material 15 in. wide, or 3-in. material 12 in. wide. It has an adjustable stop, so as not to swing back further than is desired for the particular width of the work. When not in use the saw drops below the table surface.

Other tools on the machine include a reversible spindle shaper, an upright hollow chisel mortiser and borer, a tenoner, an 18-in. sand disk, a rip guide adjustable for any width up to 22 in. and a cross-cut guide which slides in milled grooves in the table.

The combination of tools included in the machine would answer the requirements of a small electric railway, where the investment in a more expensive installation of individual machines is not warranted by the amount of millwork to be done, or where limited shop space does not allow a more complete installation.

The News of the Industry

New Plan for Cleveland

Steam Railroad and Electric Railway Officials Discuss Terminal Problem and Suburban Co-ordination

Plans for handling and co-ordinating transportation in the metropolitan area of Cleveland, including its large suburbs, are now being worked out in a series of meetings between the officials of the Cleveland Railway and O. P. and M. J. Van Sweringen, Cleveland, who are building Cleveland's new union terminal station, to be completed about 1928. All of the Van Sweringen plans for rapid transit from the Cleveland suburbs call for electrification.

Details of the working out of the transportation plans of the Van Sweringens with the Cleveland Railway have not as yet been made public, but in a statement to the Metropolitan Transportation Commission Mr. Van Sweringen said he felt that his companies would furnish the Cleveland suburbs with their rapid transit facilities, while the Cleveland Railway should have a monopoly over the bus and traction service within the city proper, which means a radius of 5 to 7 miles from the Public Square.

This may eventually mean that some of the Cleveland Railway suburban lines may come into the hands of the Van Sweringens and that there may be an interchange of transfers between the Van Sweringen rapid transit lines, which will lead into Cleveland's new union station, and the Cleveland Railway's city lines.

It is also possible that the Van Sweringens may arrange with the Cleveland Railway to build a downtown subway terminal underneath the Public Square, with approaches to the new union station.

When the Van Sweringens and the Cleveland Railway officials have completed their discussions in executive sessions it is expected that the metropolitan area of Cleveland will have one of the finest co-ordinated transportation systems in the country.

Bus Permit Denied—Iowa Interurban Would Be Impaired

A request for a permit to operate a bus line from Davenport, Iowa, to Clinton, Iowa, and from Davenport to Muscatine, Iowa, has been denied the Scenic Stage Line Company of St. Paul by the Iowa Railroad Commission. The proposed bus line would have paralleled the route of the Clinton, Davenport & Muscatine Railway, an electric line operated by the United Light & Power Company. It was brought out at a hearing conducted at Muscatine that the proposed bus line would touch at nearly all of the towns along the interurban line in addition to serving the three terminals. The bus line would have served three points which the interurban does not serve. The three towns are served by three steam trains each way daily and the towns on the interurban, 21 in number, are served by eleven trains each way daily. Some little time past the interurban railway company put in effect a new and faster schedule, increased the number of trains and has been advertising for business.

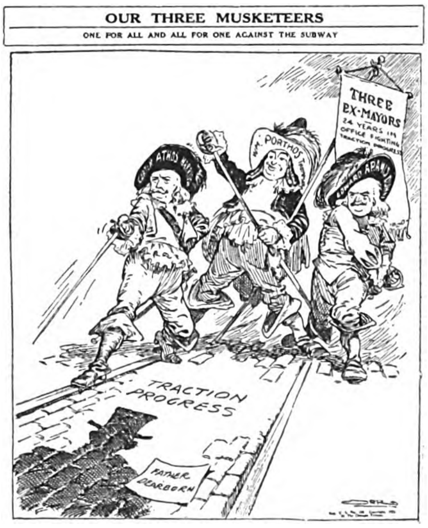
The commission held that as the Clinton, Davenport & Muscatine Railway was dependent on business from the towns along its line alone and did not traverse other states so that it could make up a loss in business elsewhere a competing bus line would probably destroy a large property investment now adequately serving the public; that it would not promote the public convenience, but would more likely inconvenience a greater number of people by impairing rail line service now provided for.

$500,000,000 Traction Vote in Chicago

Co-ordination Measure Goes Before Voters on April 7—Exciting Campaign—Ex-Mayors Oppose New Plan

CHICAGO, noted for two defeats of transportation proposals at the polls in the last twelve years, votes on April 7 on the Dever-Schwartz $500,000,000 subway co-ordination measure. The finishing touches have been put to a remarkable campaign in which 150 meetings were held in the last week alone.

The economic aspects are unusual in that the city expects to acquire the Chicago Surface Lines for $163,000,000, the elevated for about $85,000,000 and build a subway without any direct outlay on its part. The whole financing except $40,000,000 paid to the city by the Surface Lines is expected to be done out of earnings. The ordinance calls for the outlay of $702,000,000 for the physical plant over a 20-year period, all to be paid for by notes.


OUR THREE MUSKETEERS
ONE FOR ALL AND ALL FOR ONE AGAINST THE SUBWAY
THREE EX-MAYORS 24 YEARS IN OFFICE FIGHTING TRACTION PROGRESS
WM. PORTHOS
ATHOS
ARAMIS
TRACTION PROGRESS
FATHER DEARBORN

Three Ex-Mayors Pictured by Chicago "Tribune" as Blocking the Track

Possibility of a 27-mile ride for 6 cents after the co-ordination has operated a year is held out by the campaigners. At its inception the fare will be 7 cents for elevated and surface lines (subways later) with interchangeable transfers. Col. Bion J. Arnold, Major R. F. Kelker, Jr., and Robert Isham Randolph, widely known consulting engineers, support the fare reduction promise through the Non-Partisan Committee of One Thousand, which directed Mayor Dever's campaigning.

The ordinance provides a $5,000,000 stabilizing fund. When this passes $7,000,000 the fare comes down 1 cent. The experts explain that if the courts uphold the contention that this is a municipal property and tax exempt, $4,400,000 will be immediately available. This is the sum which the elevated and surface lines would have to pay in taxes. Besides, there will be an end to the burden of paying 55 per cent of net operating income into the city treasury, which the surface lines have done for eighteen years.

An early issue as to whether this was to be a privately owned or municipally owned system grew cold as the vote neared. Private investors will hold a mortgage on more than half the lines for twenty years. At that time the city will be conceded more than half ownership and will assume majority control of the operating board which will run the lines. The city will never have less than an equal voice in naming the operating board.

An anomoly has been presented by the campaigners in the declaration that the surface lines are the finest transportation plant in the country and rendering excellent service—of course with limitations. Far from the cry of inefficiency usually heard in campaigns, the city speakers have pointed out that it is physically impossible, without subways, to better downtown transportation on account of congestion.

Buses have come in for a share of the debate, but proponents of a complete bus system have made little headway. Their arguments were answered by pictures of long lines of buses, automobiles and street cars wedged for blocks in the shopping district. Buses, the campaigners said, will be used for feeders to rapid transit lines in neighborhoods not populous enough to support surface cars.

Underground campaigning has been explosive. Chicago's three ex-Mayors, William Hale Thompson, Carter H. Harrison and former Governor Dunne, came out against the ordinance. Supporting Thompson, Governor Small ordered the Illinois Commerce Commission to investigate, and supposedly condemn, the plan and was defied by the chairman, Frank L. Smith. The Thompson "transportation district," which was beaten at the polls five years ago, was revamped into a bill for the Legislature. None of the opposition moves seemed to stick.

Dunne declared his belief that the operating board has already been agreed on in the city hall and doubts whether nine men can be found who will run the lines honestly and without politics. He charges that once a man is in one of the positions, which may pay as high as $50,000 a year salary, he will be unassailable. There is no removal provision in the ordinance.

Carter Harrison declared its insufficiency condemned the subway plan. He said he would stand for nothing less than subways to every district. Under his plan there would be little surface transportation.

Hearst newspapers are working with Thompson. They claimed to have brokers' literature promising $240 gain in the market price of surface lines bonds and $37 gain for every share of stock, which is headlined: "Rich melon promised if Dever wins," and a keyline "Who Pays? Poor old city."

Thompson, ordering his own political machine solidly to the polls to vote no, has appealed to other citizens to stay away from the polls so they would not make the mistake of helping to pass the ordinance.

It has been generally conceded that the ordinance will be adopted, although it is a by-election. A poll, however, showed the sentiment to be very close. Support of 303 civic bodies is claimed for the ordinance with 25 against it.

Will Report on New York City's Suburban Problems

Governor Smith signed the Mastick bill on April 2 which creates a commission of eleven members to investigate and report upon the suburban transportation problem of the city of New York and its environs.

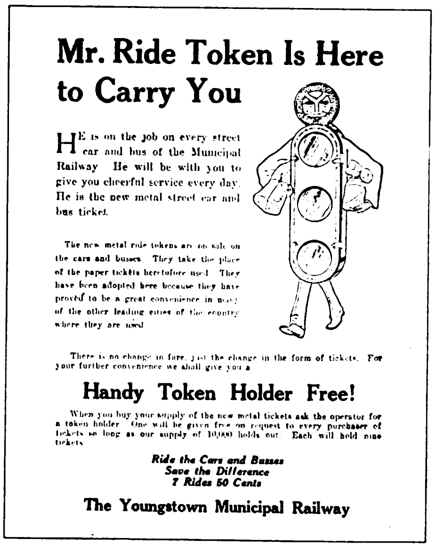
Buffalo Conference Postponed

The Public Service Commission has adjourned until April 15 the conference to be attended by the members of the commission, the municipal authorities and officials of the International Railway, Buffalo, including Thomas E. Mitten of Philadelphia. At this conference the report of the engineers of the commission detailed to check up on local service and equipment conditions will be ready and the co-operation of municipal authorities and the railway management will be asked by the commission as the most effective means of ending the traction problems of Buffalo.

New Fare in Youngstown

Weekly Ticket Plan Started as Means of Inducing Off-Peak Riding —Token Holders Sold

The Youngstown Municipal Railway Youngstown, Ohio, contemplates building up off-peak riding by the sale of a weekly ticket good for 25 rides to sell at $1.25, making the individual rides 5 cents each, and in this way restoring in a measure the 5-cent fare. This innovation will in no way affect the existing rates of fare. They are 8 cents cash or seven tickets for 50 cents, with a 1-cent charge for transfer on either cash or ticket fare.



Mr. Ride Token Is Here to Carry You

HE is on the job on every street car and bus of the Municipal Railway He will be with you to give you cheerful service every day. He is the new metal street car and bus ticket.

The new metal ride tokens are on sale on the cars and busses They take the place of the paper tickets heretofore used They have been adopted here because they have proved to be a great convenience in many of the other leading cities of the country where they are used

There is no change in fare, just the change in the form of tickets. For your further convenience we shall give you a

Handy Token Holder Free!

When you buy your supply of the new metal tickets ask the operator for a token holder One will be given free on request to every purchaser of tickets so long as our supply of 10,000 holds out. Each will hold nine tickets

Ride the Cars and Busses
Save the Difference
7 Rides 50 Cents

The Youngstown Municipal Railway

Appeal to Youngstown Riders to Use Token Holders

Each ticket will contain 25 spaces for the conductor or operator to punch out the rides as taken. The ticket will be presented by the passenger for this punching for each ride taken. Between the hours of 5 a.m. and 7 p.m. weekdays the weekly ticket is good for only one person. Between 7 p.m. and 5 a.m. weekdays and all day Sundays and legal holidays it is good for any number of persons, one ride being punched out for each of the group using the ticket in common.

No transfers will be issued on fares paid by use of this ticket.

The ticket will be good for a specified week only, starting at 12 a.m. Monday and continuing through till 12 midnight the following Sunday. This week will be designated on the face of each pass by the dates, the first week, for instance, being good from April 6 to April 12, 1925, inclusive.

The arguments in favor of the use of this form of transportation are that it will encourage short riding at the reduced rate, will increase the noonday riding, in a number of instances probably a number of persons going to and from home for lunch, and thus taking four rides a day at a total cost of 20 cents instead of two rides at a cost of 14 to 16 cents, and increasing the use of cars and buses in the evening by having family parties or other groups use the cars with weekly tickets rather than the automobiles for pleasure riding. An increase in use of the cars Sundays and holidays is also anticipated.

The introduction of this form of ticket is experimental. Whether it will be continued depends upon the results obtained after a sufficiently long trial period.

Furthermore the Youngstown Municipal Railway began the use of metal tickets in lieu of the paper strip tickets on Sunday, March 29. Apparently the change in form of tickets was most successful. More than 70,000 tokens were sold on the first day and a supply of 10,000 token carriers given free with purchase of these tickets was exhausted long before the day was finished. As a result the company has ordered more of these carriers.

Out to Win in Dallas

To win the Charles A. Coffin Foundation award in 1925 is the hope of the Dallas Railway, Dallas, Tex., and the ambition of its patrons and employees. The company is urging the co-operation of all in its effort to increase its employees' benefit fund by $1,000 to win the gold medal and to put Dallas in the forefront as the most progressive city in the United States. Every day, "in the interest of a greater Dallas by the Dallas Railway," the company is publishing *Trolley-grams*, a news sheet containing some interesting history on the company as well as some stories of a lighter vein for the amusement of the car riders. The Coffin award, established three years ago by the General Electric Company as a memorial to its late president, is made to the electric railway which during the year makes the greatest contribution toward increasing the advantages of electric transportation for the benefit of the public and the industry. The Northern Texas Traction Company, Fort Worth, won the award in 1924.

Draft of Railway-Bus System for Toledo Awaited

In answer to the demand of the city for better service and some move toward a reduction of street railway fares the Community Traction Company, Toledo, Ohio, plans to submit to the City Council in about three weeks a tentative draft of a combined street railway and bus system to serve the entire city. Along with the plan will be provision for securing the necessary additional capital to take care of approximately $900,000 of new track and street work and purchase new bus and garage equipment.

Officials of the company now are working on plans for complete rerouting and abandonment of some lines. Parts of existing lines will be given up and new all-bus routes established and in other parts of the city the bus feeder system will be enlarged. A condition of this plan for betterment of service and extensions of lines will be a monopoly of the street transportation. This is possible now because the City Council has complete authority over the establishment of city bus lines through the recently enacted Collister-Krueger act. It is almost certain that a crosstown bus line will be a feature of the new system. Company officials take the attitude that the fare problem is not the paramount issue now, but that citizens want the best service. It is pointed out that most of the responsible bus system offers which have been received by the company contemplate a 10-cent fare.

A corps of engineers from Henry L. Doherty & Company, headed by R. F. Carbutt, arrived in Toledo on March 31 to go over the plans and make estimates of needed capital and possible revenue over a period of five years. Their findings will be submitted to the New York office of the Doherty interests and then the final plan will be presented to the City Council of Toledo.

The new plan is to be presented with the idea of not modifying the Milner service-at-cost ordinance. However, it is believed that the board of control, City Council and other city authorities believe that some changes will have to be made in the ordinance to make it more effective and more responsive to conditions that have changed since it was adopted. Easier sinking fund charges may be asked.

Financing of Bus Purchases Arranged at Cleveland

The City Council of Cleveland, Ohio, on March 30 approved an unusual method of raising $2,000,000 for the purpose of improving Cleveland's transportation system by the purchase of buses and the making of rail extensions.

The $2,000,000 of new capital is to be raised by taking $33,333.33 a month out of the street car revenues, starting April 1, for a period of two years, thus accumulating $800,000. This money ordinarily would go to the interest fund and tend to reduce the rate of fare. The balance of the $2,000,000, namely, $1,200,000, is to be also set aside out of the company's income by trimming down its regular allowances for maintenance, depreciation and renewal.

With this $2,000,000 buses are to be purchased, rail lines extended and a new carhouse built.

The buses are to be purchased at once and to be ready for service in June over fourteen routes already mapped out by the company.

There will be double-deck buses on two main thoroughfares, one running east and the other west from the Public Square.

More Five-Cent Zones on New Jersey Railway

The Public Service Railway, Newark, N. J., has filed with the State Board of Public Utility Commissioners a tariff which abolishes the 8-cent unit fare on all its lines in Bergen County and substitutes a 5-cent fare. The new tariff applies to the company's Bergen Division the fare plan originally recommended by the State Board of Public Utility Commissioners and now in effect throughout the greater part of its system.

The change will reduce the length of the zones at the same time it reduces the fare in each zone. Under the present tariff there are on the lines in question thirteen 8-cent and six 5-cent zones, a total of nineteen. Under the new tariff there will be a total of 26 5-cent zones. The through fare, terminal to terminal, on the Englewood line will be reduced from 24 to 20 cents; on the Palisade line from 18 to 15 cents; on the Bergen Pike line from 26 to 20 cents. Through fares on the Hudson River and Hackensack lines are increased by 1 cent, the new fare being 30 cents, as compared with a present 29 cents; on the Fort Lee 2 cents—from 8 to 10 cents.

Long Island Work Ready

Electrification to Jamaica to Start with Summer Schedule—100 Cars Almost Ready

The work of electrifying the Montauk Division of the Long Island Railroad as far as Babylon is more than 80 per cent completed. With the exception of a short stretch at Babylon, where track changes are about to be made, the third rail has been installed on both tracks from Laurelton to Babylon. The work west of Laurelton is progressing rapidly. It is more than 20 route-miles from Jamaica to Babylon.

When the summer schedule of the Long Island Railroad, now in course of preparation, goes into effect on May 21, all steam passenger service will be removed from the Montauk Division between Babylon and Jamaica. This means that more than 80 local trains will be operated by electricity.

Sixty steel passenger cars now used in steam service will be equipped for electric operation, and 40 new motor cars are being constructed for service on the new electrified line to Babylon.

From Laurelton substation to Lindenhurst, the third rails have been alive for construction purposes. Current is being taken from the third rail for use in installing bonds at the joints in the running rails. This bonding work has been completed between Laurelton and a point just west of Lindenhurst.

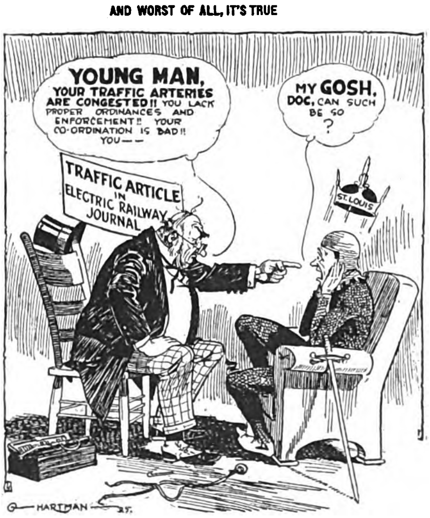
The track circuits and relays of the automatic signals have been changed from direct to alternating current between Valley Stream and a point east of Lindenhurst, to permit the use of the track rails for the return circuit of the train propulsion system, as well as for the operation of the automatic signals.

Construction work on the substation buildings at Laurelton, Freeport, Wantagh, Amityville and Babylon has been completed. Similar work on the substation at Lynbrook is nearly finished. The installation of electrical equipment in the substations at Laurelton, Lynbrook, Wantagh and Babylon is well advanced; at Freeport installation work has commenced, and will also be undertaken shortly at Amityville.

Aside from a short gap at each substation, the transmission line has been completed, including poles and wires, from Lynbrook to Belmont Junction, west of Babylon.

The work of rehabilitating the existing transmission line between Rockaway Junction and Valley Stream is about 90 per cent completed.

9,000 Words Reduced to Cartoon


AND WORST OF ALL, IT'S TRUE
YOUNG MAN, YOUR TRAFFIC ARTERIES ARE CONGESTED!! YOU LACK PROPER ORDINANCES AND ENFORCEMENT!! YOUR CO-ORDINATION IS BAD!! YOU——
MY GOSH, DOC, CAN SUCH BE SO ?
TRAFFIC ARTICLE IN ELECTRIC RAILWAY JOURNAL
ST. LOUIS
HARTMAN 25.

Artist of St. Louis "Times" Used Pencil to Reflect Recent "Electric Railway Journal" Article

Valuation of Cincinnati Properties Recommended

The report of the traction committee of the Cincinnati, Ohio, Chamber of Commerce on the 25-year traction ordinance now before the City Council has been accepted by the board of directors of the chamber. In accepting the report, which is based on the findings of Dr. Milo Maltbie, New York, public utilities expert, engaged by the chamber as consultant, the directors of the Chamber of Commerce definitely opposed the new ordinance drafted several months ago by representatives of the city administration and the Cincinnati Traction and the Cincinnati Street Railway.

According to its findings the committee is of the opinion that the proposed ordinance favors the traction interests unduly and at the expense of both the city and the car rider. With this report as a basis the Chamber of Commerce will suggest to the City Council that representatives of interested parties be called together for the purpose of drafting an entirely new ordinance. This new ordinance, it is indicated, should adjust more equitably the points raised in the chamber report.

Among the recommendations incorporated in the report is that of a valuation of the traction companies. Such a valuation is the basic and controlling factor for the settlement of all points at issue, particularly capitalization, it indicates. Other equally important recommendations are the strengthening of the city's control of the electric railways, a limitation of powers of arbitrating orders of the director of street railways, narrowing the field of court appeals, increasing the company's responsibilities with regard to street paving the maintenance, a more adequate control by the city over the management of reserves and other funds, elimination of provisions which in reality will necessitate a renewal of the ordinance in ten years, provision that the city may construct or provide other plants or equipment and elimination of the clause which might prevent the city from operating other transportations. In discussing the question of fares the report says that this issue is dependent upon the question of valuation.

Additional Bus Rights Sought in Bridgeport

Representatives of the City Service Corporation, backed by Walter B. Lashar and others, testified at a hearing held in Bridgeport, Conn., on March 28 before the Public Service Commission in regard to two applications for bus routes over which it seeks permission to operate. Counsel for Mr. Lashar was quite frank about the matter. He is reported by the Bridgeport *Telegram* to have said:

> We are ready to concede that the passenger transportation business in Bridgeport is a natural monopoly and will retire gracefully when the traction company deserves such a monopoly. We are out to force the Connecticut Company to adopt the 5-cent fare in Bridgeport.

Mr. Lashar, who is head of the American Chain Company, hopes to "bring the trustees of the Connecticut Company out of winter quarters to look Bridgeport over" and not to say again that "Lashar is crazy."

The new company is seeking the right to operate over two routes. Not only the Connecticut Company but the Bridgeport Auto Transit Corporation interposed objections to the granting of rights to the new company on the ground that its operation would mean needless duplication of facilities. The Connecticut Company representatives indicated their willingness to increase their facilities to meet the city's needs.

The commission reserved decision on all of the applications.

Incidentally Mr. Lashar has indicated that with the completion of the new Lordship highway from Hollister Avenue to the shore manor the present scheme of operating a trolley system to Lordship will be abandoned and buses substituted. The Lordship Railway is a 4-mile line. Mr. Lashar is understood to be its owner.

Kansas City Bus Ordinance Still Deadlocked

The March 30 meeting of the City Council of Kansas City, Mo., failed to break the deadlock in the lower house over certain issues regarding the ordinance which was drafted and introduced to the City Council for the purpose of granting the Kansas City Railways a three-year franchise for the operation of an auxiliary bus service upon the city's streets. Two weeks ago, when the bill came up for consideration in the lower house, one of the Democratic Aldermen proposed an amendment which would reduce the term of the franchise from three years, upon which the railway's receivers and the Council committee had previously agreed, to a period terminating six months after the end of the present receivership. Upon receipt of the bill, as amended, the bus committee reconsidered, but returned the bill to the lower house in its original state.

Rumors were current on March 30 to the effect that the Democratic faction would propose to amend again the bill so as to terminate the franchise one year after the close of the railway receivership. However, when the bill came up the Democratic bloc carried the vote to refer it once more to the special bus committee. The vote was 8 to 7 in favor of returning the bill, the seven Republican Aldermen being in favor of decisive action.

Another hearing on the bill is expected to be held by the special bus committee at a meeting April 3.

It seems doubtful whether the bloc in the lower house can be broken, and if it cannot and the bill is amended, there is said to be much skepticism in regard to possible approval of Judge Kimbrough Stone, referee in bankruptcy, since the receivership is expected to terminate at the end of this year. It is thought that Judge Stone will consider the time limit too short for the required investment.

Sliding Fare Scale Suggested for Atlanta

The special traction committee of the City Council will recommend a sliding fare for Atlanta, Ga., it was learned on March 30. This is in accordance with the Beeler plan and the request of the Georgia Railway & Power Company for a revision of its contract with the city. The contract to be recommended is understood to include the following provisions:

> That the initial fare be 10 cents, four tickets for a quarter, a 5-cent fare for children and free transfers.
>
> That the company establish a barometric fund of $250,000. Should earnings sink to a point where it was necessary to use this fund, and drop, say, below $50,000, a second scale of fares would go into effect. Under this scale, fares would be 10 cents, no tickets, a 5-cent rate for children, and free transfers. Still further adjustments are provided.

The valuation of the railway will be fixed by the committee at $16,500,000, with 8 per cent declared a fair return. Should rates under the first fare scale fail to give this 8 per cent return, then the barometric fund would be used until it fell below the $50,000 mark, when the second scale would become effective.

The committee, it is understood, will refuse to strike out the tax on gross receipts, but may recommend the payment of a lump sum in its place. The committee may also set a lump sum of $100,000 a year for street repair work.

Sweeping changes in the routing of cars are also in prospect.

With the consent of the city, the company anticipates no difficulty in securing the permission of the Public Service Commission to adopt a sliding scale of fares.

Phoenix Controversy Unchanged

The case brought by the city of Phoenix, Ariz., to revoke the franchise of the Phoenix Railway is still in the Superior Court, having been transferred from the United States District Court. It is likely that the hearing will not take place until next fall. It was charged by the city that the company had failed to live up to the conditions of its franchise, particularly with respect to carrying out paving work. In the meantime the Yellow Taxicab has applied for a permit to operate on one of the principal thoroughfares. At a recent hearing before the Arizona Corporation Commission on this matter the Phoenix Railway was not represented as an opponent, but many citizens on their own initiative opposed the granting of the permit. No decision has as yet been rendered.

Summary of Recent Bus News

The decisions of the United States Supreme Court in the Buck and Bush cases are expected in Washington to bring about regulation of highway transport by the Interstate Commerce Commission. Those decisions also are thought to imply a new obligation of the federal government in the matter of road construction. The states, of course, still are in a position to prescribe regulations for the use of roads which could be made so onerous as to discourage bus operations, but it is believed that the state public service commissions will enter into the spirit of the decision and prescribe reasonable regulations. The decisions are also regarded as furnishing another high obstacle in the path of those who contend that the federal government has no constitutional authority to participate in road building.

Installation of bus service in the city of Oswego, N. Y., with an estimated outlay of $75,000, is planned by the Empire State Railroad Corporation. Operation over four routes with at least six buses is planned. The only obstacle appears to be a decision as to the fare to be charged. The Council demands that the fare be put at 5 cents. T. C. Cherry, vice-president of the corporation, contends that it is impossible to operate buses at that fare. He has asked that the city run the buses for six months as an experiment to prove his contention.

Governor Fuller of Massachusetts has signed the bill, enacted this year by the Legislature, authorizing the railroads to carry freight and passengers by motor vehicles, when the Public Utilities Department certifies that such service is in conformity with public convenience and necessity. This bill was offered in the Legislature by former Representative James B. Brown, legislative counsel for the Boston & Maine Railroad. This law will have a far-reaching effect upon the present contest with the railroad, motor truck and bus line companies.

In Connecticut the usual procedure of attempting to give electric railways the right to operate buses directly has been reversed. In order to clear up a controversy in which the trolley interests claimed the right to establish bus lines anywhere a bill provides that such companies must get permission from the Public Utilities Commission, just as an independent company would. A bill allowing electric railways to substitute buses for street cars without sacrificing the franchise has also been introduced.

Mayor Van Zandt has signed an ordinance authorizing the Rochester Railways Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways, to operate a bus line in the Ridge Road from the city line to Waggs' Corners, where it will connect with city trolley lines. The action of the Mayor is significant in that it indicates the policy of the city to vest transportation in the city exclusively in the railway, with which it has a service-at-cost contract. The company now has only to obtain the permission of the State Public Service Commission.

News Notes

Federal Court Will Decide Income Tax Question. — Suit to determine whether Seattle public employees in utility service are legally liable to income tax will be pressed through the federal courts to the Supreme Court, if necessary to secure a final adjudication of the question. This is in accordance with approval by the City Council finance committee of an ordinance giving Corporation Counsel T. J. L. Kennedy permission to prosecute such a case. Under an order from the internal revenue department, street railway employees have already paid income tax, and the proposed suit will take the form of an attempt by one of the employees to recover the amount of the tax so paid.

Commission Approves Milwaukee Contract. — The Wisconsin Railroad Commission has approved the proposed service-at-cost contract between the city of Milwaukee and the Milwaukee Electric Railway & Light Company, leaving only the vote of the people to decide whether the city should accept the agreement. The commission declared that the value of the company's properties as fixed in the contract was both reasonable and just, as was the method provided for ascertaining the value in the future. Referring to the rate of return fixed in the contract, the commission found that the rate allowed was reasonable and would serve as a satisfactory basis for adjustment of utility rates.

Magnanimous Action of Employees. —Following a recent meeting of 250 employees of the Cass Avenue division of the United Railways, St. Louis, Mo., when a prize of $200 was awarded the workers for having the best accident record during February, A. O. Kelly, a motorman, arose and moved that the money be sent to the tornado sufferers of southern Illinois. The motion was adopted unanimously and the prize money was immediately wired to Murphysboro, Ill., to swell the relief funds being raised for the victims of the storm.

"Ride the Street Cars for Safety."— In a recent newspaper advertisement the East St. Louis & Suburban Railway, East St. Louis, Ill., says that "ride the street cars for safety" is more than a slogan—it is a definitely proved fact. In proof of its statement it gives a little of the history of its own company with respect to fatalities. Since Jan. 1, 1917, when the present method of keeping records was installed, the East Side Electric Railway carried on all divisions more than 276,000,000 passengers and operated more than 44,000,000 car-miles, all without a single fatality to a riding passenger. "Think it over," says the ad, "not a single fatality over the whole system in more than eight years." The company states that statistics show that riding on street cars is safer than walking. Further, that riding on street cars is safer than any other form of urban transportation.

Higher Fare Sought.—With operating expenses exceeding revenues on its Kenosha-Waukegan motor coach line, the Chicago, North Shore & Milwaukee Railroad has been forced to apply to the Illinois Commerce Commission for permission to increase fares between these two points to 3.6 cents for tickets and 4 cents a mile cash fare. The rate of fare which has been in effect since the installation of the service in December, 1923, has been 3 cents a mile when tickets are purchased or 3.3 cents a mile when cash fares are paid.

Considers Seven-Cent Fare Request. —After hearing argument by the counsel of the Virginia Railway & Power Company and attorneys representing the city of Richmond, Va., the State Corporation Commission recently took under advisement the request of the company for a 7-cent fare. The present fare charged by the company on all of its railway lines in the city of Richmond is 6 cents.

Mayor Wants Municipal Ownership. —Mayor J. Herman Hallstrom, Rockford, Ill., has publicly gone on record as favoring municipal ownership of Rockford's traction system. The Mayor is opposed to the present traction company and has indicated that any other company which might obtain a franchise was only a means to an end in his plan for a municipally owned system.

Reduced Fare Books Authorized.— The Oklahoma Corporation Commission recently granted the application of the Shawnee-Tecumseh Traction Company for permission to sell books containing 20 tickets for $4 to cover fare on interurbans from Shawnee to Tecumseh. The books may be used by the purchaser or any member of his immediate family. The application was accompanied by resolutions adopted by the citizens of Shawnee and Tecumseh consenting to the change.

New Negotiations Expected. — The Supreme Court of Ohio has decided against the city of Toledo in its fight on behalf of a lower power rate and for the return of $200,000 of excess power charges. These charges were collected from the Community Traction Company by the Toledo Edison Company over a period of two years or more when no power contract between the two companies had been approved by the street railway commission. This action now clears the way for new negotiations between the commissioner and officials of the Toledo Edison. The courts held all the way through that the Public Utilities Commission, by terms of the ordinance, had jurisdiction over the power rate. Action is also pending before the utilities body. The court battle was started under Commissioner W. E. Cann.

Operators Take Cash Fares. — The United Traction Company, operating in Albany, N. Y., and vicinity, recently eliminated the fare collection boxes and passengers now hand cash fares directly to the operator of the car, who rings them up. Cars have been equipped with facilities for recording fares so received. This marks a departure in the operation of one-man cars in this section. It is expected the new system will expedite the movement of cars.

Foreign News

Operation of One-Man Express Bus in Paris Successful

Express bus service inaugurated in September by the Société des Transports en Commun de la Région Parisienne on the Passy-Bourse line is proving very satisfactory. A 15-minute reduction in the running time has been made by these new express buses.

The new vehicles are similar to those recently placed in service in Calais, Anvers, Rotterdam and The Hague. A four-cylinder motor with a speed of 1,500 r.p.m. is mounted on a 3-ton chassis. Seats are provided for 25 passengers. Entrance and exit facilities are provided at the right hand side at the front, similar to the arrangement ordinarily found on one-man buses in the United States.

Instead of a door, however, a low wire gate is used. Its operation is interlocked with that of folding steps. Opening and closing of the gate is controlled by a lever placed at the left of the operator. To permit quick opening by a passenger in case of emergency, a foot pedal has been placed in front of the entrance. This pedal is painted red and instructions concerning its use are posted in the vehicle. A second emergency exit has been arranged at the rear of the bus.

Metropolitan Railway Electrification

Operation of electric trains on the Metropolitan Railway, London, England, between Harrow and Richmansworth began on Jan. 5. This extension involves approximately 23 miles of single track, on which the 600-volt third-rail system is used. Automatic signals were also installed. At present half-hourly service will be rendered. The area served is a growing residential district and the introduction of electric service is expected to hasten the development of this section.

A short branch line to Watford is now being electrified. When this work is completed there will be two electric railways operating from London to Watford, the other being an extension of the Baker Street & Waterloo Railway. The line from the Baker Street terminal, London, to Harrow was electrified several years ago.

London Tubes to Have Additional Escalators.—Contracts of the value of £107,000 have been placed by the City & South London Railway with Waygood-Otis, Ltd., for the construction of escalators at the six underground stations on the Morden extension, now under construction. These moving stairs will be of the cleat comb type, found satisfactory in the installation at Clapham Common station.

One Tramway in Paraguay.—Paraguay has only one tramway, which is in Asuncion, and 17 miles of this line is operated by electricity, 7 miles by steam and 2 miles by animal power.

Financial and Corporate

2,000 Winnipeg Shares Sold in Five Days

New stockholders to the number of 1,280 were added by the Winnipeg Electric Company, Winnipeg, Man., at the close of its recent customer-ownership campaign. The sale of 2,000 shares of preferred stock met with instant success. Although advertised as a ten-day sale, the whole allotment had been sold before the end of the fifth day. The campaign was continued throughout the ten days, ended March 11; however, in order not to disappoint many Winnipeg people who desired to become owners of the company's securities, 2,845 shares, in all, were sold.

The actual selling of the stock was conducted by employees of the company—motormen, conductors, linemen, clerks, meter readers, stenographers, etc. Their efforts were supplemented by a well-planned advertising campaign, by means of which every householder was reached.

The work of the company in the matter of organizing the stock-selling campaign has been very favorably commented upon. At the outset A. W. McLimont, vice-president, appointed a committee consisting of L. Palk, M. F. Wardhaugh and H. C. Howard, publicity agent, to direct the sale and effect the organization necessary. Meetings of employees were addressed by members of the committee and instructions on "How to Sell" were given. Each employee turned in to the committee the names of ten prospects likely to purchase stock, to whom specially prepared literature was sent prior to the time the employees called.

It was the policy of the company to sell not more than five shares to any one customer. Rigid observance of this rule resulted in wide distribution of the stock. Among the new stockholders are men and women in all walks of life, located in all sections of the community. It is estimated that as a result of this campaign the number of preferred stockholders was doubled.

The stock which was sold was part of an issue of preferred stock made a number of years ago and was acquired from large holders for customer-ownership campaign purposes.

Railway Bus Operation Analyzed

Twenty-three cents per mile is the average cost of operating 25-passenger capacity buses during 1924 by 38 electric railways, either directly or through subsidiary companies. So says E. J. Murphy, chief statistician of the American Electric Railway Association, in an analysis of reports contributed by him to April *Aera.*

These 38 companies operated 14,358,084 bus-miles and had in daily operation 328 buses out of a total of 497 owned, with a seating capacity of 12,050, or an average of 24.54 per bus.

Information obtained from 45 companies owning 564 buses indicates a revenue of $3,491,800 for the year, 44 of which, operating 806.5 miles of route, report 15,972,552 bus-miles. The number of passengers carried as reported by 43 companies was 47,852,899.

Complete reports were obtained from 38 companies for the full calendar year, but sixteen companies reported a comparison of operations for two years. Taken as a whole the 38 companies failed to earn revenue sufficient even to meet operating expenses, not including taxes and fixed charges.

Revenue Passengers Total 38,049,947

The railway properties of the Columbia Gas & Electric Company during 1924 carried 38,049,947 revenue passengers and operated 3,948,561 car-miles. The Columbia system operates an electric railway serving several cities and towns in northern Kentucky, directly across the Ohio River from Cincinnati. Cars are operated on eighteen separate routes, crossing two bridges over the Licking River, which connect Newport with Covington, and over two Ohio River bridges, bringing the railway system into the modern Dixie Terminal in Cincinnati. The transportation system serves a total population of 120,000 people on the Kentucky side of the Ohio River.

$636,696 Loss at Boston

Wage Increases Have Adverse Effect on Company Under Public Control—Increase in Local Fares from Five Cents to Six Cents Not Harmful—Trustees Hope to Close June 30 Year Even

DURING the calendar year which closed with Dec. 31, 1924, gross receipts and number of revenue passengers carried were the largest in the experience of the Boston Elevated Railway, Boston, Mass., either under private management or public control. Owing, however, to increases in wages, the first under the Mayberry award and then later under the McLaughlin award, the operating labor cost of the past calendar year has mounted to $17,358,670, an increase of $1,134,394.55 over the operating labor cost of 1923. There was a loss of $636,696 for 1924, compared with a gain of $679,631 for 1923.

Immediately following the announcement of the decision in the last arbitration proceedings it was necessary to increase the 5-cent local fare, which had been established largely for the outlying district, to a basis of 6 cents. The trustees say that there has been no substantial diminution in traffic as a result of this increase, and feel that the additional revenue thereby secured will aid largely in meeting the increased costs.

During 1924 739,151 more revenue passengers were carried than in 1923. Passenger revenue mileage increased by 1,939,014, in large measure due to increased use of one-man cars, which permitted an increased service without corresponding increase in cost. The one-man car and bus-miles were 31.7 per cent of the total surface-miles operated. The number of revenue passengers increased on weekdays and Saturdays, but there was a decrease of traffic on Sundays and holidays. The operation of buses increased. The miles covered in 1922 were 63,937; in 1923, 465,382, and in 1924, 890,901.

The sixth fiscal year of public operation of the railway closed with June 30, 1924. As there was at that time no excess of receipts over expenditures for the preceding twelve months, no payments were made to the cities and towns which had contributed to the loan assessment to meet the deficit of the first year of public operation. The aggregate amount contributed by the municipalities in 1919 was $3,980,151. The excess of receipts over cost of service during the past years had been applied, first, to the restoration of the exhausted reserve fund, and after this was accomplished there was paid back to the cities and towns $517,196 in July, 1922, and $1,114,557 in July, 1923. The aggregate of these amounts was distributed among the cities and towns served by the railway and reduced to $2,348,397, the balance still due them.

The trustees explain that the summer and fall months were characterized

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1924	1923	1922	1921	1920
Total receipts	$34,175,319	$34,096,813	$32,699,176	$33,277,025	$34,031,636
Operating expenses					
Wages	17,358,670	16,244,275	14,772,340	15,563,255	17,261,445
Material and other items	3,203,378	3,236,805	2,903,650	3,093,934	3,310,858
Injuries and damages	740,025	822,775	555,355	518,249	640,165
Depreciation	2,496,000	2,004,000	2,004,000	2,004,000	2,004,000
Fuel	1,424,058	1,842,396	1,853,111	1,663,617	2,597,652
Total operating expenses	$25,222,133	$24,130,253	$22,088,458	$22,843,056	$25,769,122
Taxes	1,623,995	1,688,139	1,587,168	1,546,758	1,142,987
Rent of leased roads (including dividend rental under chapter 159, Acts of 1918)	3,175,566	3,185,577	3,646,595	4,203,061	4,102,230
Subway and tunnel rents	2,125,593	2,026,936	2,008,414	1,963,737	1,790,432
Interest on bonds and notes	2,602,891	2,316,026	1,891,315	1,494,258	1,514,963
Miscellaneous items	61,835	70,247	65,016	54,707	59,067
Total cost of service	$34,812,016	$33,417,181	$31,286,987	$32,105,580	$34,378,803
Loss for year	$636,696	....	....	....	$347,167
Gain for year	....	$679,631	$1,412,189	$1,171,444	....

Profit and loss adjustments not included in above.

as usual by large expenditures in reconstruction work. While the summer traffic was affected as usual by vacation and holiday limitations, it was influenced to an unusual extent by automobile competition and a depression in certain lines of business with accompanying lack of employment and consequent loss in riding. From July 1 to Nov. 1 the excess of cost of service over receipts was $1,042,556, exclusive of charge for back pay and profit and loss adjustments, an aggregate considerably larger than during the same period of 1923, and the restoration to a surplus of receipts over cost of service was slow. This exhausted the reserve fund, but November showed a small excess of receipts over cost of service, and the receipts for December exceeded expenditures by $305,503. Since then a gratifying increase in receipts has taken place. The trustees feel there is reason to believe that with the closing of this fiscal year on June 30 it will be found that receipts have been equal to expenditures. To accomplish this result, in view of the increased rate of wages awarded last summer, the trustees have been compelled to lessen service and to decrease working hours and number of men employed.

STATEMENT OF SPECIAL TRUST FUND OF BOSTON ELEVATED RAILWAY DEC. 31, 1924

Principal of trust fund as established		$1,500,000
Accretions and accumulations to Dec. 31, 1924		620,899
Total special trust fund		$2,120,899
Income from June 10, 1922, to Dec. 31, 1924	$217,888	
Less amount paid on account of retirement of second preferred stock	162,513	$55,375
Investments		$2,108,291
Cash on deposit		$67,983

ALLOCATION OF RECEIPTS PER PASSENGER OF THE BOSTON ELEVATED RAILWAY IN 1924

	1924 Cents	1923 Cents
Labor	4.534	4.246
Interest on bonds and notes	0.680	0.606
Rent of subways and tunnels	0.555	0.530
Rent of leased roads	0.829	0.834
Coal	0.372	0.482
Depreciation	0.652	0.524
Damage	0.193	0.215
Material and other items	0.853	0.866
Taxes	0.424	0.442
Total	9.092	8.745
Average receipts per revenue passenger	8.926	8.923

TRAFFIC STATISTICS OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDING DEC. 31

	1924	1923	1922	1921
Round trips operated	6,994,749	6,488,082	6,059,531	5,773,584
Passenger revenue	$33,419,172.22	$33,297,951.50	$31,834,022.77	$32,253,629.59
Passenger revenue per car-mile (cents)	59.69	61.61	62.94	64.89
Passenger revenue per car-hour	$5.67	$5.71	*	*
Passenger revenue mileage	55,988,679†	54,049,665†	50,575,088†	49,706,697
Passenger revenue car-hours	5,894,115	5,826,993	*	*
Revenue passengers carried	382,888,848	382,149,697	356,593,942	337,252,080
Revenue passengers carried per car-mile	6.838	7.070	7.051	6.785
Revenue passengers carried per car-hour	64.96	65.58	*	*

*Comparable statistics not available. †Including motor bus mileage.

COMPARATIVE PASSENGER STATISTICS OF THE BOSTON ELEVATED RAILWAY—REVENUE PASSENGERS CARRIED

Year	Week Day Average	Saturday Average	Sunday Average	Holiday Average	Total for Year
1924	1,109,861	1,216,132	630,755	727,191	382,888,848
1923	1,109,274	1,196,301	652,404	758,915	382,149,697
1922	1,030,303	1,144,320	617,148	691,890	356,593,942
1921	975,745	1,068,295	578,860	696,691	337,252,080
1920	960,737	1,072,319	591,063	703,634	335,526,561
1919	934,918	1,078,635	596,182	706,429	324,758,685
1918	985,384	1,147,809	658,902	775,634	348,664,700
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1915	992,283	1,140,046	685,726	846,860	352,469,586

COMPARATIVE POWER STATION STATISTICS OF THE BOSTON ELEVATED RAILWAY

	1924	1923	1922	1921	1920	1919	1918
Tons of coal burned	240,493	260,032	273,441	215,870	258,087	287,670	281,677
Pounds of coal per kilowatt-hour (direct current on line)	2.068	2.264	2.553	2.174	2.353	2.835	2.772
Average price of coal per ton	$5.921	$7.085	$6.777	$7.71	$10.07	$5.91	$6.26
Net cost of power for car service per kilowatt-hour (cents)	1.093	1.227	1.414	1.172	1.921	1.307	1.58
Net cost of power per total revenue car-mile (cents)	4.833	5.468	6.153	4.815	8.538	5.439	4.668
Direct current annual output (kilowatts)	260,401,225	257,270,357	239,905,874	222,461,060	245,676,503	239,892,118	227,582,057
Direct current maximum hour output (kilowatts)	86,245	82,965	78,755	75,905	72,295	71,760	67,965

ALLOCATION OF ASSESSMENT ON CITIES AND TOWNS OF BOSTON ELEVATED DEFICIT, YEAR ENDED JUNE 30, 1919

History of the 1919 loan assessment on cities and towns (chapter 159, special acts of 1918)

Cities and Towns	Passengers	Per Cent	Amount	Distribution of July, 1922, Repayment	Distribution of July, 1923, Repayment	Balance Due
Boston	2,100,423	71.9330	$2,863,042.50	$372,034.92	$790,029.10	$1,700,978.48
Cambridge	283,475	9.7081	386,397.11	50,209.95	106,622.54	229,564.62
Somerville	122,583	4.1981	167,090.75	21,712.43	46,106.54	99,271.78
Brookline	74,553	2.5532	101,621.23	13,205.06	28,040.99	60,375.18
Medford	59,754	2.0464	81,449.82	10,583.91	22,475.56	48,390.35
Malden	55,838	1.9123	76,112.44	9,890.35	21,002.65	45,219.44
Everett	54,823	1.8775	74,727.35	9,710.36	20,619.69	44,397.30
Watertown	41,198	1.4109	56,155.96	7,297.12	15,496.14	33,362.70
Arlington	32,477	1.1122	44,267.25	5,752.26	12,215.36	26,299.63
Chelsea	29,659	1.0157	40,426.40	5,253.17	11,154.86	24,018.37
Newton	27,201	.9316	37,079.09	4,818.20	10,231.84	22,029.05
Belmont	18,746	.6420	25,552.57	3,320.40	7,051.43	15,180.74
Quincy (Commonwealth of Massachusetts)	15,569	.5332	21,222.17	2,757.69	18,464.48	....
Stoneham (Commonwealth of Massachusetts)	3,674	.1258	5,007.03	650.63	4,356.40	....
Commonwealth of Massachusetts.*	....	......	....	....	690.24	†690.24
Totals	2,919,973	100.00	$3,980,151.67	$517,196.45	$1,114,557.82	$2,348,397.40

Based on traffic counts made July 24, 25, 26, 27, 1919, in accordance with the provisions of section 14, chapter 159, special acts of 1918.

*From the July, 1923, repayment the Commonwealth of Massachusetts deducted $690.24 to reimburse itself for the difference between 126 days' interest at 4.28 per cent on $4,000,000 (note issued July 17, 1919, due Nov. 20, 1919) and $3,980,151.67, the amount paid to the Boston Elevated Railway $297.33

And interest from July 17, 1919, to July 19, 1923, on amount the state deducted to pay assessment of Quincy and Stoneham 392.91

Amount of expense to state to be assessed to towns and cities pro rata to their original contribution $690.24

†Credit.

Since the last annual report the matter of capital requirements and future control of this railway has been exhaustively considered by a recess committee of the general court, and the report of that body is now before a joint committee.

The trustees review the principal improvements to the property during the year. The need does not exist for noting all of them here. On April 21 the operation of surface cars in the East Boston tunnel was superseded by the operation of specially constructed steel rapid transit trains. This change materially decreased the running time, eliminated congestion at way stations and made possible a far larger use of the tunnel. Since Aug. 27 elevated train service has been extended daily from 12:30 to 1:15 a.m. for the convenience of night patrons. Block signals have been installed on curves in the Tremont Street subway. The new instruction school in Sullivan Square was completed and has been placed in service. A new alternating-current signal system for the entire Forest Hills section was placed in operation during October. The so-called Bartlett Street units of the Everett repair shops were completed and the personnel and equipment transferred from the Bartlett Street shops on March 1, 1924. The work of erecting at Forest Hills a new lobby building for the car service men, a large garage for buses and a suitable heating plant to provide for all of the buildings grouped at this location has been nearly completed.

Final plans for the extension of rapid transit service in the Dorchester district by utilization of the Shawmut branch of the New Haven Railroad have been worked out in conjunction with the Boston Transit Department. The lease of the premises has been executed, all legal formalities completed, the contract for the first section let and work of construction started. When finished this extension will provide for operation of the Cambridge-Dorchester tunnel trains as far as Ashmont, or 3¾ miles from the present terminus at Andrew Square, and the operation of high-speed trolley service on private right-of-way from Ashmont to Mattapan. During the twelve months 17.15 miles of track and special work have been rebuilt and 3.77 miles of track and special work repaired.

During the year eight East Boston tunnel cars were received in addition to the forty originally purchased and eighty-nine new cars of the one-man, two-men type.

In 1918 the number of cars held out of service for repairs was 18 per cent. During 1924 a satisfactory record of 6 per cent has been maintained. Whereas in 1918 50 per cent of the surface car mileage was operated with articulated and box cars, during the year 1924 only 7 per cent was so operated.

Operating expenses on account of accidents were lowered from $975,020 in 1923 to $914,043 in 1924. Accidents per million miles operated with one-man cars were reduced from 230 in 1923 to 205 in 1924. Accidents per million miles operated with two-men cars were reduced from 259 in 1923 to 249 in 1924.

Power costs were lower in 1924 than in 1923, due to plant improvements and to lower price of coal. The average number of pounds of coal consumed per kilowatt-hour direct current at the cars was 2.068, the lowest of any year in the history of the railway. The average cost of coal for power during the year was $5.921 per long ton. The number of tons of coal burned was reduced from 260,032 in 1923 to 240,493 in 1924, notwithstanding an increase in kilowatt-hour output. The maximum current output for any one hour was 86,245 kw., which was the greatest in the history of the railway. During the year 115,675 ft. of underground conduit was laid.

Revenue Well Maintained at Pittsburgh

First Report Since Receivership Reflects Good Results of Operation Under New Agreement with Municipalities—Plans for Bus Service Ahead—Intensive Merchandising Program

THE first annual report of the Pittsburgh Railways, Pittsburgh, Pa., since 1918 has just been presented. In 1918 the railway passed into the hands of the United States court and was operated by three receivers. By agreements with the administration of the city of Pittsburgh the report now made public includes the entire year, and the various statements are based on the full years' activity. Gross revenue from railway operation was $22,063,776 and net income for the year $10,075. But these figures tell only part of the story. The year was one in which the management had to feel its way and adjust itself to a changed environment.

Revenues of the railway were well maintained during the year even though the general business depression caused some recession as compared with the previous year. The budget requirements and operating expenses were kept within bounds, with the result that the report shows a small surplus with ample funds being used for rehabilitation of property and the providing of better service. Nearly 19 miles of track were rebuilt.

The company says that the policy of furnishing more and better transportation service has been productive of increased earnings. This policy will be continued, and it is expected that still better results will be obtained in the future. Among the innovations which were tried was the Sunday 25-cent pass, extension of transfer privileges and special Sunday 10-cent transfer. In two cities, Washington and McKeesport, a weekly pass is being tried out. Of the new commercial department it is said some new innovations have resulted and a feeling on the part of patrons that the railway was co-operating to give the best possible service. The results have been gratifying.

Negotiations are in progress with the Philadelphia Company and one of its subsidiaries to supplement the transportation service of the Pittsburgh Railways with buses. The railway is not in a position to finance such additional operations. A contract between the ralway and the bus company will protect the railway and is expected to be of mutual advantage in rendering adequate and effective service.

The need for rapid transit as well as adequate trolley service is evident, and ways and means are being studied to meet these conditions. While it is realized that railway service in Pittsburgh is rendered under great difficulties, a situation prevails now because of improved service, new equipment, arrangements to meet changing conditions in the communities served, of harmonious feeling which embraces the municipal administrations, the railway and the public. It is the endeavor of the management to continue this situation and improve the service.

Termination of the receivership on Feb. 1, 1924, was made possible through the contract or agreement with the city of Pittsburgh, which was of a mutual nature and in brief provides:

Recognition of property valuation established by the Public Service Commission.

Annual return of sufficient amount to pay fixed charges, including return on some Philadelphia Company holdings, plus interest on new money put into the property.

Car fare to be adjusted to provide sufficient revenues to meet the allowed return on investment after operating expenses, depreciation, taxes, etc.

Previous license fees, paving charges, taxes, etc., to be substituted by blanket payment aggregating $300,000 per annum, payment to be made only when earned.

Establishment of a traction conference board to represent the city and the boroughs which entered the agreement, the public, and the railways. The board is composed of four members, all of whom are to receive annual compensation.

An incentive for economical management through a division of any surplus.

It is explained that this contract also paves the way for readjustment of capitalization to result eventually in one ownership of corporate properties that now number more than 100.

SUMMARY OF INCOME OF PITTSBURGH RAILWAYS FOR THE YEAR ENDED DEC. 31, 1924

(Prepared in accordance with the terms of the agreement between the city of Pittsburgh, sundry other municipalities, Philadelphia Company and Pittsburgh Railways.)

Gross revenue from street railway operations		$22,063,776
Operating expenses:		
Maintenance of way and structures	$2,685,014	
Maintenance of equipment	2,513,962	
Traffic	160,225	
Power	2,034,876	
Transportation	7,440,743	
General	761,235	
Miscellaneous	1,764,846	
Taxes	668,017	
Total		18,028,918
Net revenue from street railway operations		$4,034,859
Auxiliary operations:		
Operating revenues	$182,357	
Operating expenses	125,607	
Net revenue from auxiliary operations		56,750
Total net revenue from operations		$4,091,608
Non-operating revenues:		
Rental of real estate and buildings	$30,777	
Interest and discount	299,985	
Miscellaneous	3,405	
Total	$334,167	
Non-operating expenses	16,233	
Net revenue from other operations		317,934
Gross income		$4,409,542
Income charges:		
Items under agreement:		
Return of 6 per cent on property valuation of $62,500,000	$3,750,000	
Return of 6 per cent on additional capital of $5,000,000 for new property	300,000	
Payments to city of Pittsburgh and other municipalities in lieu of licenses, paving assessments, etc.	331,019	
Items not under agreement:		
Interest on judgments and settlements	15,464	
Rental of Seventeenth Street incline plane	2,984	
Total		4,399,467
Net income for the year		$10,075

STATISTICS OF OPERATIONS OF THE PITTSBURGH RAILWAYS FOR 1924

Miles of road		329.27
Miles of track		592.06
Car houses		23
Car shops		5
Passenger cars—motor	1,088	
Passenger cars—trail	238	
Miscellaneous cars	257	
Total cars		1,583
Passengers carried—revenue		272,315,161
Passengers carried—total		324,688,853
Car-miles operated		39,593,051
Car-hours operated		4,455,466
Earnings per passenger car-mile—cents		55.3
Average fare per revenue passenger—cents		7.95

As provided for in the contract with the city, a current liability of approximately $8,200,000 was assumed and the various creditors agreed to take one-tenth of their claims per annum over a period of ten years, without interest.

Immediately on return of the property to corporate management arrangements were made to consummate the $5,000,000 of new financing, which was provided for under the agreement. These arrangements were made through the Union Trust Company, Pittsburgh. There were issued $2,000,000 of 6 per cent notes, maturing serially over a period of four years; $3,000,000 of 6 per cent car trust bonds, maturing serially over a period of fifteen years.

The proceeds of the equipment trust bonds purchased 225 modern passenger cars. The proceeds of the note issue are being spent for improved carhouses, shop equipment, tracks, etc. Nearly all of the $3,000,000 has been used, and practically all of this equipment has been received or is en route. A small portion of the $2,000,000 has been spent and the balance will be expended during next year.

The matter of refunding and refinancing the railways is progressing and it is hoped and expected that in the next annual report a satisfactory plan will be announced.

Among the problems confronting the management of the railways the first year was the adjustment of wages as proposed by the motormen and conductors. The working agreement with the men expired on April 30. After protracted negotiations there was a cessation of service for about 60 hours. As a result an agreement was entered into to continue the contract with the men for a period of two years at the same rates of pay.

Operating Income Higher

Boston & Maine's Electric Lines Show Improvement—Report Gives Details of Bus Plan

The 92d annual report of the Boston & Maine Railroad to the stockholders explains in detail the company's plan of correlating rail and bus service "with the hope of bringing about an economic relationship which will avoid wasteful duplication of transportation agencies and result in benefit and convenience to the public." Reference has been made in the ELECTRIC RAILWAY JOURNAL previously to the activities of the Boston & Maine Railroad in that direction. President Hustis states that because of the belief that in many instances transportation on rails could be better and more economically performed by motor vehicles on the highways the Boston & Maine Transportation Company has been incorporated to undertake highway motor service where the traffic warrants. This company will also supply service when other means of transportation are not available. In this way the discontinuance of railway lines as may be authorized will be accomplished with the least possible hardship to the communities affected.

Competition of common carrier passenger buses along the main line routes of the railroad became so keen in 1914, particularly in Massachusetts, in which state no certificate of exigency is required, that it seemed necessary for the railroad to present its case to the various cities and towns where bus companies were applying for licenses to compete with the railroad. Some cities and towns have declined to issue licenses to independent bus lines, recognizing that they were taking from the railroad the more profitable standard fare traffic, and that, deprived of this traffic, the railroad could not afford to continue low rate service for commuters. In some instances where such bus companies continued to operate without licenses, in violation of the law, legal proceedings were taken and are now pending.

The report for the year 1924 segregates the electric railway earnings. The accompanying statement shows figures for the operation of the Portsmouth Electric Railway, running from Portsmouth to Hampton, N. H., and the Concord Electric Railway, which operates from Concord to Manchester and Penacook, N. H., both under the supervision of the Boston & Maine.

PORTSMOUTH ELECTRIC RAILWAY AND CONCORD ELECTRIC RAILWAY

	Year Ended Dec. 31, 1924	Dec. 31, 1923
Passenger revenue	$263,529	$298,787
Other revenue	11,675	16,125
Total	$275,204	$314,912
Expenses:		
Maintenance of way and structures	$32,039	41,477
Maintenance of equipment	47,946	69,748
Power	37,042	47,093
Transportation	83,315	87,442
Other expenses	16,809	17,884
Total operating expenses	$217,152	$263,645
Net revenue	58,053	51,267
Tax accruals	24,817	24,308
Operating income	$33,236	$26,959

Surplus for January Quarter on Rochester Lines.—The report of the operations of the Rochester lines of the New York State Railways for the quarter ended Jan. 31, 1925, shows a surplus of $33,627 in excess of the 6 per cent guaranteed return on its property investment under the service-at-cost contract. From railway operations alone a surplus of $38,814 is shown, with a deficit from bus operations of $1,384 from the crosstown trackless trolley line and $1,349 from the Dewey Avenue bus feeder route. The balancing account of Jan. 31 shows a deficit of $251,564.

Fitkin Interests Reported After More Railways.—An agreement is reported looking toward the sale of the Municipal Service Company, Philadelphia, Pa., to Fitkin & Company, New York. The Municipal Service Company owns the Citizens' Traction Company, Oil City and Franklin; the York Railways, York, Pa., and the Youngstown & Suburban Railway, Youngstown, Ohio.

Security Issue Sought.—The Key System Transit Company, Oakland, Cal., has applied to the Railroad Commission for authority to issue and sell $500,000 of its series B first mortgage gold bonds, dated Jan. 1, 1925, and due July 1, 1938, and bearing interest at the rate of 6 per cent. It is proposed to use the proceeds from the sale of these bonds in acquiring all the properties of the Oakland & Haywards Railway and the East Oakland Railway and to redeem all outstanding bonds of those two corporations.

Belt Line Increases Earnings.—Operation of the Tacoma Municipal Railway, Tacoma, Wash., as an industrial belt line for the tideflat district resulted in increasing the car line's earnings by $1,525 during February, a figure nearly double the best previous showing, according to the report for the month. The city is ahead $4,238 on belt line operation for the past four months, it is reported.

Deficit for Eight Months.—For the eight months ended Feb. 28, 1925, the Interborough Rapid Transit Company, New York, N. Y., showed an increase in total revenue from all sources of $567,972 over the corresponding period ended Feb. 29, 1924. This advance was more than offset, however, by increaase in taxes and in income deductions, chiefly higher Manhattan (elevated) rental, which became effective July 1, 1924, under the readjustment plan. While operating expenses were lower than during the preceding period, there was a deficit for the first eight months of the current fiscal year of $247,700. Compared with a similar period in 1924 this figure represented an improvement of $1,047,389.

Merger Talk Started in Washington.—Officials of the Washington Railway & Electric Company and of the Capital Traction Company, Washington, D. C., have had one informal conference recently to consider the possibility of bringing about a merger. No further developments are expected, however, for some time. Just before adjournment Congress passed a bill authorizing a voluntary consolidation, with a proviso that the actual terms of merger be ratified by Congress at the next session. Following passage of the act the chairman of the Public Service Commission of the District suggested to the heads of both companies that they confer informally on the question. At the same time the commissioner let it be known that the commission stands ready to assist in arriving at a basis for a union of the two systems should later developments warrant such a course.

Revenues Showed Decrease in February.—In spite of diminishing jitney competition, total revenues from the railway department of the Georgia Railway & Power Company, Atlanta, Ga., showed a decrease of $23,650 during the month of February compared with February of last year. This brings the total decrease for the last eight months up to more than $263,650. The February decrease was $4,650 greater than the $19,000 figure of January. March figures, however, are expected to show the effects of jitney elimination.

Old Equipment Sold.—The Quincy Street Railway, Quincy, Ill., recently sold to a junk dealer sixteen cars which had been idle in the carhouse, many of them since the days after the mule cars. The Quincy system has 28 cars in regular service and sufficient reserves to handle traffic loads.

Heavy Bond Issue Under Discussion.—Possibility of floating a $20,000,000 bond issue for the Seattle Municipal Railway, Seattle, Wash., with which to retire the present bonds, purchase new equipment, pave between tracks and make other necessary improvements is being discussed among members of the City Council. The present bonds against the railway bear 5 per cent interest. By floating an issue extending over a longer period, the advocates of the plan assert that the annual payments would not be so heavy, and the system would be in a position to buy new equipment, make extensions and needed improvements. The street railway department has gone back to a cash basis six weeks earlier than anticipated, owing to an increase in revenue and savings by the department. The date set for abandoning the warrant plan had been May 10, but was set forward to March 25.

Legal Notes

CALIFORNIA.—*Company Responsible for Assault by Motorman.*

The conductor got into a dispute with a passenger in regard to transfers and summoned the motorman, according to rule, by emergency three bells. The motorman assaulted the passenger and this assault was held to be within the scope of his employment and the company was responsible. (Galloway vs. United R.R.'s of San Francisco, 232 Pacific Rep., 491.)

CALIFORNIA. — *Passenger Injured at Station While Crossing Track to Board the Car.*

A passenger lawfully on the premises of an interurban railroad at a place provided for the stopping of cars to take on passengers is not negligent *per se* in failing to stop, look and listen before crossing the intervening track to board a car. A shelter having three sides but no windows, provided by the carrier and used by passengers awaiting the arrival of cars was held to be a "station," as respecting the degree of care to be used by both passengers and carriers. (Wilkinson vs. United Railroads of San Francisco, 232 Pacific Rep., 131.)

CONNECTICUT.—*Burden of Evidence in Accident to Infant.*

A child five years old, while crossing the track, was injured in a city street by a trolley car. In a case of this kind, the Supreme Court of Connecticut declared the burden was on the plaintiff to adduce evidence of facts from which the jury might reasonably find the defendant's motorman was negligent as alleged and that such negligence was the approximate cause of the injury. (Simuaskas vs. Connecticut Co., 127 Atlantic Rep., 918.)

FEDERAL COURT—*Expert Witness Must Be Especially Qualified — Treatment of Depreciation, Franchises, etc, in Valuation*

This decision was in the District Court of the District of Colorado on the valuation of the Denver Tramway and was rendered Dec. 13, 1924. The company, through its receiver, claimed that the ordinance by which the city permitted the city to charge only 6 cents for fare was confiscatory, and asked permission to charge a higher fare from the federal court by whom the receiver had been appointed. The city intervened. Its answer claimed that the tramway was contractually bound to a 5-cent fare, and that the 6-cent ordinances were for temporary purposes only and did not change the contractual obligations of the company. The court appointed a special master to hear testimony as to the value of the property, and evidence was presented by Frank T. Woy and A. L. Drum for the company and Dr. D. F. Wilcox for the city. In its decision rendered Dec. 13, 1924, the court reviews the qualifications of each of these witnesses to act as an expert on valuation and it held that Messrs. Drum and Woy could qualify as expert witnesses on the value of the railway property but that it was an error in matter of law to permit Dr. Wilcox to testify as such an expert. The court also said that, ordinarily, reproduction cost new, less depreciation, is the dominant factor in the valuation inquiry under consideration, and it must be the rule where there are no other data on the subject. Testimony on values of experts who have given the subject long study and reflection ought not to be lightly weighed. The figures of the experts Woy and Drum on depreciation, as ascertained by inspection, and other items, were largely followed in the decision. An allowance was permitted for going value, but the court held that the value of the company's perpetual easements in the city streets, which was put at $2,000,000 could not be included in the valuation of the company's property for rate making purposes. The court upheld the receiver's plea that the 6-cent fare was confiscatory. (Westinghouse Electric & Mfg. Co. vs. Denver Tramway, 3 Federal (2d) Rep., 285.)

FEDERAL COURT.—*Greater Care Necessary by Motorman Where View Is Obstructed.*

The judge in a District Court charged the jury that where the view of a crossing is obstructed, increased caution is required of the person undertaking to cross the interurban track at this point, but he refused the request of the plaintiff's counsel to charge "that the defendant was required to use increased or greater care as it approached this crossing, if the weeds and bushes were on its own right-of-way." This refusal was held to be prejudicial error in the Circuit Court of Appeals, Sixth Circuit. (Napier vs. Northwestern Ohio Ry. & Power Co., 2 Fed. Rep. (2nd), 701.)

MARYLAND—*Railroad Liable to Person at Freight Yards Receiving Shipment Only for Injuries Arising from Concealed Peril.*

A truckman visited the freight yards of a railway company to take away a shipment, and to save time tried to remove the shipment himself from the bottom of a pile. Other freight fell on him and injured him. The railway company was not held responsible. (Texas Co. vs. Washington, B. & A. Electric Ry., 127 Atlantic Rep., 752.)

MASSACHUSETTS — *Attempt to Board Car at Alighting Platform.*

After leaving a rapid transit train at a platform, a passenger changed her mind and decided to board the next train. When it arrived and all passengers leaving the car at that point had disembarked, she attempted to enter by the open door but was caught by the door and thrown to the floor. It developed that there were two platforms, one a loading and the other an unloading platform, and the company did not expect any passengers to board a car at the unloading platform, but as there were no conspicuous signs to warn passengers not to board the train at this point the company was held responsible for this accident. (Threlkeld vs. Boston Elevated Railway, 146 Northeast Rep., 367.)

MINNESOTA.—*Injury from Emergency Stop.*

A motorman made an emergency stop to avoid a collision with a vehicle and because of this sudden stop a passenger was thrown to the floor and injured. It was held that the company was not negligent as a matter of law, but that the case should be decided by a jury. (Sullivan et al. vs. Minneapolis Street Railway, 200 Northwest Rep., 922.)

MISSOURI.—*Last Clear Chance Doctrine in Case of Trespasser.*

Where a boy, while riding as a trespasser on the rear end of a trailer, was injured when the trailer backed against another car standing in the rear, the last clear chance doctrine was upheld. An instruction by the trial court requiring the jury to find, before rendering a verdict for the plaintiff, that the motorman of the rear car negligently failed to move his car backward, when in the exercise of ordinary care he could have backed car without danger to any person, was held by the Court of Appeals not erroneous for failure expressly to require the jury to find that there was free space into which motorman could back. (Finn vs. United Railways of St. Louis, 267 Southwest Rep. 416.)

NEW YORK.—*Value of Property for Rate-Making Purposes.*

The present increased cost of construction must be considered in determining the value of a public utility property for rate making purposes, and due weight must be given to present reproductive costs. It is inadequate to use the average of the ten-year period prior to the date of valuation. Where a power and light company had been allowed a low rate of return for a long period, it was entitled to a return of more than 7.1 per cent on the value of its property. (People ex rel. Adirondacks P. & L. Co. vs. Public Service Commission, 217 New York, Sup., 284.)

OKLAHOMA.—*Time Taken at Stops.*

It is the duty of a street railway company, at car stops, to stop the cars a sufficient length of time to afford passengers an opportunity, by the use of ordinary care and diligence to alight therefrom while the car remains stationary. (Oklahoma Union Railway vs. Mitchell, 231 Pacific Rep., 1062.)

WISCONSIN. — *Care Required of Driver of Automobile.*

Where the driver of a heavily loaded truck drove it onto a car track, when his view of the track was obstructed because of an automobile parked at the curb, he was negligent as a matter of law, although the trolley car which struck him was going at illegal speed. (Griffin vs. Milwaukee E. R. & L. Co., 201 Northwestern Rep. 254.)

Personal Items

New President in New England

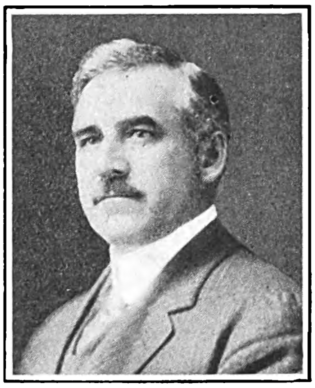
Operator of the Holyoke Street Railway Elected President of the New England Street Railway Club

Louis D. Pellissier, president and general manager of the Holyoke Street Railway, Holyoke, Mass., was elected president of the New England Street Railway Club at the meeting on March 26. Mr. Pellissier, with his brother, George, who is assistant general manager and chief engineer of the company, has made an enviable reputation in handling this 70-mile Massachusetts road. In fact, his work has attracted attention even outside of the electric railway industry. Not so long ago an editor of one of the foremost papers in the country, a man concerned only incidentally with railway operations, expressed the wish privately that more railway men had the knowledge and insight into railway matters possessed by the Pellissier brothers. He wanted to get them to make recommendations in his own city, but said he realized that it was impossible. He lamented that fact, but said he recognized it was the prerogative of the Pellissiers to stick to their knitting.

This is exactly what they have done. They have applied themselves intensively to their own tasks, and their application has been intelligently directed. The Holyoke property has one of the few zone systems in the country. Like many other cities, Holyoke found during the war that it was necessary to raise fares. The maximum fare on the Holyoke system was, however, kept down by dividing the property into a number of zones on the principle of one zone in each community. The layout of the system is well adapted for this plan. With this sense of salesmanship has gone the realization of the need for keeping up the physical property. As a result the Holyoke Street Railway is one of the best maintained in the country. In fact, in 1917 the company passed its dividend rather than curtail the appropriation for maintenance. It is significant that the company has an unbroken dividend record for 30 years, except in this one instance; that it is now paying 6 per cent and that for much of this long period it paid 8 per cent.

Louis D. Pellissier began his work for the company immediately after his graduation from business college in Springfield, Mass., in 1892. The Holyoke Street Railway had recently been electrified and Mr. Pellissier served first as a conductor. Three years later he was appointed bookkeeper and paymaster and continued in these positions until 1903, when he was elected treasurer of the company, acting also as claim agent. This office he retained until 1912 and then he was made vice-president and general manager. Upon the death of W. S. Loomis, president of the company, in 1914 Mr. Pellissier was made president. In 1919 he was also made treasurer and general manager of the Northampton Street Railway, which position he still holds. Since 1914 he has also been president of the Mount Tom Railroad, which runs the beautiful scenic resort known the world over as Mount Tom, together with its noted mountain railway.

Mr. Pellissier was born in Superior, Wis., Feb. 18, 1870. His parents settled in the historic old town of Hadley shortly after Mr. Pellissier was born, and there he grew to manhood. He attended the local public schools and Hopkins Academy, reputed to be the second oldest institution in the United States. He remained on the farm until he was 21 years old and then decided to enter business, for which he fitted himself by attending business college.



L. D. Pellissier

Last year Mr. Pellissier was vice-president of the New England Street Railway Club, representing Massachusetts. The club has six vice-presidents, one for each state in New England. Mr. Pellissier is a strong believer in association activities. He attends the conventions himself and sees to it that the members of the staff also attend.

Interstate Changes Announced

W. Marshall Dale has succeeded Ira E. Guthrie as secretary and treasurer of the Interstate Public Service Company, Indianapolis, Ind.

W. S. Campbell is purchasing agent in place of G. H. Dallow.

W. J. Fox is now superintendent of shops at Scottsburg, succeeding J. E. Hester, who resigned last May to enter business for himself.

Joseph O'Hara, general superintendent of the railway division of the Illinois Power Company, Springfield, Ill., is on an indefinite leave of absence to recuperate from a long illness. Carl E. Davis, former claim adjuster, will act in his place.

Mr. Storrs in New Office—His Book

Lucius S. Storrs, recently appointed as managing director of the American Electric Railway Association, entered upon the duties of that office on April 2. His desk in the temporary quarters arranged for him at the association's office was covered with flowers in anticipation of his coming. As one of his first acts Mr. Storrs had himself formally presented by Secretary Welsh to all the employees whether or not he had ever met them before. His services will be available to every electric railway in the United States. They will also be available to the public. One of his outstanding duties will be to act as a liaison officer between large national business or civic organizations and the electric railway interests.

As indicated very briefly in the ELECTRIC RAILWAY JOURNAL for March 26 Mr. Storrs was the guest of honor at a testimonial and farewell dinner given at the New Haven Lawn Club by the officers and heads of the Connecticut Company. John K. Punderford, the incoming president, presided. The speakers were unanimous in commending Mr. Storrs for his tact, diplomacy and fairness in dealing with the public and the employees and the successful manner in which he administered the affairs of the company at all times, and particularly through the war and the post-war period, with its many difficult problems, until now, when the property is regarded as second to none in the world. All expressed their regret at his leaving and were eloquent in their assurance of the high regard with which he is held by his associates and the public. Congratulations were showered upon him for the eminent position he is to occupy in the transportation industry and all predicted a continuation of his success in the broader field to which he has been chosen. The speeches were punctuated with much delightful humor.

At the close of the last address Joseph F. Berry, formerly counsel of the Connecticut Company at New Haven, acting in behalf of those present, presented to Mr. Storrs a beautiful silver loving cup.

A novel and impressive testimonial in the form of an album containing the signatures of more that 3,800 officers and employees of the company, which was compiled by William J. Sellner of the construction department, was also given to Mr. Storrs. It was prefaced with the following inscription:

> Time, the Immortal, in whose book all things are recorded, opens its pages to receive the record of your passing to the newer and broader field of activity to which your ability as an executive has led.
>
> It is with profound regret that we look upon your going (although knowing full well that it is a big step forward and upward) for we cannot help the selfish wish that it were not so. Nor can we doubt that you, too, find it difficult to sever the ties that for so many years have bound you to a company which, under your leadership, has grown to occupy the high position which the Connecticut Company now holds.
>
> Appreciating to the fullest extent the honor bestowed upon you and upon us as a company by the election of you, our president, to the most eminent position in the electric railway industry, we offer you our sincerest congratulations and our best wishes for the continuation of that success which has characterized your progress.
>
> And, in parting, we pledge ourselves to

the maintenance of that high standard for the company which has ever been inspired by our association with you.

Following the presentation, Mr. Storrs responded feelingly to the many praises expressed during the evening and for the testimonials. He said the past fourteen years would live in his memory as the happiest of his life, claiming that whatever success he has attained was made possible only through the loyal co-operation of all. He prophesied for Mr. Punderford the same loyalty, the same faithfulness and the same success. Mr. Storrs said it was impossible adequately to express his regret at leaving so splendid a group of friends and co-workers and wished them Godspeed.

The committee of arrangements consisted of Walter J. Flickinger, Edward T. Chapman and John M. Hamilton.

At the speakers' table were: John W. Colton, Walter J. Flickinger, Edward M. Day, George D. Watrous, Charles Cheney, John K. Punderford, Lucius S. Storrs, Leonard M. Daggett, Joseph F. Berry, Victor S. Curtis and James W. Welsh.

G. H. Harris Acting General Manager at Oakland

Important changes have been made in the personnel of the Key System Transit Company, Oakland, Cal., most of which went into effect April 1.

C. O. G. Miller remains as president and W. R. Alberger as vice-president, but Mr. Alberger has temporarily relinquished his duties as general manager.

The acting general manager of the company is George H. Harris, formerly chief engineer, who was inducted into his new duties when Mr. Alberger started on a trip to the East the latter part of March. Mr. Alberger, it is announced, will visit Chicago, St. Louis, Detroit, Cleveland, Philadelphia, New York and other large Eastern cities, where he will study transit problems and make a report thereon when he returns to duty.

President Miller has denied that Mr. Alberger contemplates going on the retired list after his trip.

"The report has been repeated a great deal lately," he said, "and I should like to see it stopped."

A new position has been created—that of assistant to the president. This will be filled by C. C. Vargas, who will retain his duties as comptroller in charge of the auditing and accounting departments. The purchasing and stores departments will also be under him.

E. F. Smith, cashier, has been promoted to the office of assistant manager of the department of public relations, and Angus Clark has been advanced from land and tax agent to the position of cashier. He will also be assistant secretary.

Frank Locke has been appointed assistant cashier and Wayne Allen has been promoted from chief clerk of the purchasing department to assistant purchasing agent.

It is explained that constantly increasing duties compelled President Miller to ask for an assistant. The other changes are made, it is understood, largely at the behest of the new assistant to the president.

The land and tax office has been abolished and the several functions previously performed by that department have been distributed among the others.

J. Frank Johnson Resident Head of Toledo Traction

Announcement has been made in Toledo, Ohio, that Benjamin C. Adams, president of the Community Traction Company, and vice-president and general manager of the Toledo Edison Company for the last two years, is to leave soon for Kansas City to become head of a large company combining the gas properties of Henry L. Doherty & Company in several nearby states.

Management of the Community Traction Company will be put entirely in the hands of J. Frank Johnson, now vice-president and general superintendent. Mr. Johnson has been in the Doherty organization for a number of years, serving first as an executive with the Toledo & Western Railroad. He was one of the receivers of that property. Later he was sent to Toledo and assigned to the Community Traction Company, and some time ago was made general superintendent.

Mr. Adams will be succeeded as president by either Henry L. Doherty or Frank R. Coates. Mr. Adams has served on the Doherty properties at Joplin and St. Joseph.

Carroll L. Proctor, for three years head of the Empire District Electric Company, Joplin, Mo., will go to Toledo to succeed Mr. Adams as vice-president and general manager of the Toledo Edison Company. He was born in Charlotte County, Virginia, in 1880 and was graduated from the Virginia Polytechnic Institute. His first job was with the General Electric Company at Schenectady as a tester.

Later Mr. Proctor went to Athens. Ga., as general superintendent of the Athens Railway & Electric Company, and in 1912, when the property was taken over by the Doherty interests, he remained and has been a Doherty executive ever since. After seven years at Athens he was assigned to Joplin. He served for a time as vice-president and general manager of the Danbury Gas & Electric Company, Danbury, Conn., and later returned to Joplin.

Frank R. Coates remains as president of the Toledo Edison Company.

The change in Toledo will be effective about April 15.

Mr. Woodlock on I.C.C.

Thomas F. Woodlock, financial writer and a member of the board of directors of the Père Marquette and St. Louis-San Francisco Railroads, was sworn in April 1 as a member of the Interstate Commerce Commission under the recess appointment offered him by President Coolidge. Mr. Woodlock has resigned from the two railroad boards.

Forest E. Winterding, formerly connected with the Wisconsin-Minnesota Light & Power Company at Eau Claire, Wis., as civil engineer, has left that company to become chief engineer of the Wisconsin Traction, Light, Heat & Power Company at Appleton in charge of all construction work.

George Kuhn is superintendent of shops of the International Railway, Buffalo, N. Y., and not George Hulme, as was erroneously published in the ELECTRIC RAILWAY JOURNAL, issue of March 28, 1925, page 528. J. W. Hulme was superintendent of shops at Buffalo some time ago, but resigned in 1923 to become assistant superintendent of car equipment of the Interborough Rapid Transit Company, New York, N. Y.

L. E. Hollar was promoted to general superintendent of the Michigan Railroad and the Chicago, Holland & Grand Rapids Railway with headquarters in Grand Rapids, Mich., effective March 1. Mr. Hollar started with the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway at South Bend, Ind., in 1906 and remained there until 1920 as superintendent of transportation. He relinquished that position to become affiliated with the Michigan Railroad as superintendent of the Northeastern division, which he retained until his present advancement.

John L. Fahey has been made chief claim agent of the Scranton Railway, Scranton, Pa. He entered the employ of the company in 1913. Later he became affiliated with the claim department and acted as private secretary to his father. He continued in that capacity up to the time of his father's death on Feb. 16, 1925. Announcement of his appointment to succeed his father was made on Feb. 19.

Charles W. Chase, Gary, Ind., has been appointed general manager for Charles Currie, the receiver of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind. Mr. Chase is president of the Gary Street Railway. As general manager for the receiver of the South Shore lines, he will have active charge of the operation of that property.

A. G. Carson has been appointed manager of the Wisconsin Public Service Corporation, Green Bay, Wis., in charge of all utility departments. L. B. Works has been appointed assistant manager. Mr. Carson has been identified with Wisconsin properties for several years. In 1919, while manager of the Manitowoc & Northern Traction Company and also of the business of the Wisconsin Public Service Company in Manitowoc and Two Rivers, he had his field of operations extended by the additional appointment as general superintendent of the Wisconsin Public Service Company in Green Bay. Before going to Manitowoc he was superintendent of the Eastern Wisconsin Electric Company in Fond du Lac and chief engineer of the Wisconsin Electric Railway and of the Eastern Wisconsin Electric Railway & Light Company in Oshkosh for several years. He began his public service work with the Grand Rapids, Grand Haven & Muskegon Railway in the power and transportation department and later he was made chief engineer of the Winnebago Traction Company of Oshkosh.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

General Electric Sales Hold Up Well

Orders received by the General Electric Company, Schenectady, N. Y., during the year 1924 were $283,107,697, compared with $304,199,746 in the year 1923, a decrease of 7 per cent.

Unfilled orders at the end of the year were $68,958,000, compared with $87,112,000 at the end of 1923.

The export business of the company is conducted by the International General Electric Company, Inc. The total of all orders received by the International company during the year was $17,590,000, compared with $21,743,000 during 1923. The net sales billed were $22,590,107 during 1924, compared with $22,371,526 for 1923.

	1924	1923
Net sales billed	$299,251,869	$271,309,695
Less: Cost of sales billed, including operating, maintenance and depreciation charges, reserves and provision for all taxes	264,909,538	241,653,948
Net income from sales	$34,342,330	$29,655,746
Income from other sources	10,793,352	8,345,781
Total income	$45,135,683	$38,001,528
Less: Interest and discount on debentures and other interest payments, and additions to general reserve	5,900,135	4,476,410
Profit available for dividends	$39,235,548	$33,525,118
Less: 6 per cent cash dividends on special stock	1,195,405	656,379
	$38,040,142	$32,868,739
Less: 8 per cent cash dividends on common stock	14,404,980	14,289,316
Surplus in excess of cash dividends	$23,635,162	$18,579,423
Surplus at Dec. 31, 1923	82,762,095	....
	$106,397,258	....
Less: 5 per cent dividend paid in special stock, $9,005,035; delivery of Electric Bond & Share Company stock, $25,030,000	34,035,035	....
Surplus at Dec. 31, 1924	$72,362,223	....

The International company's business was conducted at a profit available for dividends of $2,474,845, compared with $2,469,463 in 1923. Dividends of $700,000 were paid during 1924, of which the General Electric Company received $592,082. This sum is included in the financial statement as part of the income from investments.

In carrying out the provisions of the Coffin Foundation the following awards were made for the year:

In May, 1924, the committee of the National Electric Light Association awarded the Charles A. Coffin medal to the Public Service Corporation of Northern Illinois and $1,000 to the Employees' Benefit Association of that company.

In October, 1924, the committee of the American Electric Railway Association awarded the Charles A. Coffin medal to the Northern Texas Traction Company of Fort Worth, Tex., and $1,000 to the Mutual Aid Association of that company.

The advisory committee of the company awarded forty-three Charles A. Coffin certificates of merit, carrying with them honorariums in cash to employees of the company for meritorious work and distinguished service performed during the past year. Among them were twelve workmen in the shops, seven foremen, fifteen engineers and nine members of the commercial organization.

$4,000,000 Order Impending

Plans and specifications for new subway cars which will cost between $3,000,000 and $4,000,000 have been sent by the Brooklyn-Manhattan Transit Corporation to the Transit Commission for approval. These plans call for subway cars of a type different from the present B.-M.T. subway cars. The new cars are known as triplex articulated cars. Each triplex unit is made up of three car bodies permanently united and mounted on four trucks with wide end doors to permit passage between cars. In capacity, each triplex unit, with its three car bodies, is the equivalent of two of the largest present subway cars.

The company already has under construction and nearly completed four of these triplex units, the equivalent of an eight-car train of the present subway cars. This train of cars will alone cost close to $300,000. It is expected that these new cars, now under construction, will be delivered in May of this year. In the progress of construction, various changes and improvements in the plans have been made and these are embodied in the plans now submitted to the Transit Commission for approval in order that the company may buy additional cars.

After approval by the commission, bids will be invited from car builders for 50 or 65 triplex cars, the equivalent of 100 or 130 present cars. If prices are sufficiently reasonable the larger number will be ordered and a program started of retirement of certain types of "L" cars. The company now has a number of "L" cars requiring major repairs which cannot be made because of inadequate shop facilities due to failure of the city to build shops, as it agreed to do in Contract No. 4 made in 1913. If the cost of new cars is reasonable as compared with the cost of repairing present "L" cars, the company states that it will place an order for the larger number of new cars.

The new cars were mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 20 and Sept. 27, 1924, pages 466 and 538.

To Improve Organization of Executive Departments

It is expected that the Bureau of Mines will be transferred from the Interior Department to the Department of Commerce. The Bureau of Mines is a scientific bureau intended as a direct aid to industry and commerce. Its usefulness depends largely on its ability to co-operate with industry. This transfer, by Presidential order, is expected to follow the action of President Coolidge in transferring the Patent Office from the Department of the Interior to the Department of Commerce. In this connection Secretary Hoover said that a vigorous campaign should be undertaken for the removal of the present injustices toward American patentees and American manufacturers which exist by virtue of the character of patent laws in many other countries. He said that at the present time an American patentee is required to manufacture continuously in foreign countries under his patent or lose his patent rights. Further, that no such requirement is made in the United States. The result is that our inventors and manufacturers, in order to protect their inventions, have been driven to the establishment of a large number of factories abroad, whereas foreign patentees have been able to use their patents in the United States actually to prevent manufacture here.

Mr. Hoover stated that an international convention for the protection of industrial property would take place at the Hague on Oct. 8, 1925, at which the American government was to be represented and where proposals would be made for the equitable and equal treatment of patentees in all countries.

Gasoline Electric Buses on Long-Term Payments to Railways

The Electric Truck Transportation Corporation, 25-31 W. 43d Street, New York, N. Y., has announced that it is considering the opening of a new department to finance the sale to electric railways of gasoline-electric buses on an attractive basis of long-term lease payments.

Mr. Cardoza, president of the corporation, stated that it is the idea to confine the plan to the established utilities in the best position to operate the equipment properly.

Metal, Coal and Material Prices

Metals—New York	Apr. 1, 1925
Copper, electrolytic, cents per lb	13.625
Copper wire base, cents per lb	15.875
Lead, cents per lb	8.425
Zinc, cents per lb	7.43
Tin, Straits, cents per lb	52.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.75
Weatherproof wire base, N.Y., cents per lb.	18.75
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1272
Turpentine (bbl. lots), N. Y., per gal	0.93

New Sales Representative for Six Wheel Company in Chicago

P. B. McGinnis, mechanical expert and sales representative with the Chicago office of the Westinghouse Air Brake Company since 1911, has joined the Six Wheel Company, Philadelphia, in charge of sales in central Western territory, with an office in Chicago.

In 1902, at the age of 16, he entered the car repair department of the Frisco Railroad. He served a short time as wireman's helper with the Westinghouse Electric & Manufacturing Company when the Chicago Metropolitan Elevated was being equipped with multiple-unit control by that company. He then joined the elevated operating organization as air brake and control inspector and remained in that capacity for a period of five years.

In 1909 he was engaged by the L. B. Stillwell Company, New York, to assist in equipping the cars of the Hudson & Manhattan Railroad, then under construction at the plant of the Pressed Steel Car Company. Later in the same year he became general air brake inspector of the Inland Empire System, Spokane, Wash. In the summer of 1910 he again went East to take charge of air brake installation on the cars being built for the Hudson & Manhattan Railroad by the American Car & Foundry Company.

For about a year Mr. McGinnis remained with the Hudson & Manhattan Railroad as general air brake inspector, and then joined the forces of the Westinghouse Air Brake Company.

Rolling Stock

Knoxville Power & Light Company, Knoxville, Tenn., has announced specifications on the sixteen new cars referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 14, page 436. The details follow:

Date order was placed	Feb. 27, 1925
Date of delivery	June 1, 1925
Builder of car body	Cincinnati Car Company
Type of car	Double-end, single-truck, closed passenger
Seating capacity	28
Total weight	19,000 lb.
Length over all	28 ft. 6 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	10 ft. 3¾ in.
Body	Steel
Interior trim	Natural mahogany
Headlining	¼-in. Agasote
Roof	Arch
Air brakes	Westinghouse
Curtain material	Pantosote No. 89
Destination signs	Keystone
Door-operating mechanism,	National Pneumatic Company
Fare boxes	Cleveland
Heater equipment	Consolidated Car Heating Company No. 1522-I
Headlights	Ohio Brass WDF No. 28519
Journal boxes	3-in. x 6-in.
Lightning arresters	Electrolytic
Motors	General Electric, 35 hp.
Finish	Yellow enamel
Registers	None
Sanders	Air
Seats	Pullman type
Seating material	Green velour
Trolley catchers	Ohio Brass No. 13141
Trolley base	General Electric
Trucks	Cincinnati
Ventilators	Railway Utility Company honeycomb
Wheels	26-in.

Piedmont & Northern Railway, Charlotte, N. C., has placed an order with the Pressed Steel Car Company, Pittsburgh, Pa., for 150 automobile freight cars of 100,000 lb. capacity. These cars have Hutchins steel roofs with Hutchins steel ends. They are to have steel underframes with steel superstructure, 10-ft. 6-in. double door opening, cast-steel truck side frames, cast-steel truck bolsters and Westinghouse friction draft gear with Symington attachments. The cars are to be delivered about July 1.

Empire State Railroad, Syracuse, N. Y., will likely be in the market for six buses if the plans looking toward the installation of bus service in Oswego are carried out.

Missouri & Kansas Railway, Kansas City, Mo., it is reported, has purchased three new cars, at a cost of $14,000 each. Since the fire in Overland Park last month the company has borrowed cars from the Kansas City Railways.

United Railways, St. Louis, Mo., has ordered five six-wheel chassis from the Six Wheel Company, 1800 Lehigh Avenue, Philadelphia, Pa., not 1880 Lehigh Avenue, as reported in the ELECTRIC RAILWAY JOURNAL for March 28, page 530. The five bus bodies are being built at the plant of the St. Louis Car Company.

Track and Line

New Brunswick, Canada.—An electric railway is to be constructed from Caraquet to Plaster Rock, New Brunswick to join the Canadian Pacific Railway Plaster Rock-Perth branch. Notice of application for charter has been given. The new line will be approximately 90 miles long. Indications are that a start in construction will be made this year on the Caraquet end. Operation of the line is expected to be from provincial hydro-electric stations, including a new development to be opened this year at Grand Falls.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed work on the installation of double tracks on its Thirty-fifth Street line.

Power Houses, Shops and Buildings

Ottawa Electric Railway, Ottawa, Canada, has just completed its new shops, situated about ½ mile from the center of the city, which have been under construction since last April. The area of the shops, which are to be known in the future as Champagne Shops, is 235 ft. x 300 ft. The new building will contain the electrical shops, air-brake department, machine shop, carpenter shop, paint shop and another carhouse. The type of construction is structural steel frame, reinforced - concrete roof slab and floor slabs. Convenient to the carhouse section is a large conductors' and motormen's rest room. The storeroom, offices, paint shop, conductors' and motormen's rest room are heated by direct low-pressure steam. The remainder of the building is heated by an indirect system designed to keep temperature at 60 deg. The lighting wiring is run entirely in steel conduit.

Trade Notes

Wagner Electric Corporation, St. Louis, Mo., has announced the removal of its Atlanta office and service station on April 1 to 145 West Peachtree Street, also the removal of its Cleveland office and service station on the same date to 1412 East 25th Street.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has announced that Tom Moore, formerly purchasing agent of the Virginian Railway, has been appointed its representative in charge of the Southern territory. He is located at Room 811, Royster Building, Norfolk, Va.

Riley Stoker Corporation, Worcester, Mass., announces the following changes in sales representatives. G. H. Sanger has been transferred to the Chicago office at 541 Marquette Building, having formerly been located at the Philadelphia office. He succeeds E. W. Wagenseil, who has resigned to become sales manager for the Buckeye Drier Company. A new representative of the Riley Stoker Corporation in the Denver and Salt Lake territory is the Mine & Smelter Supply Company, with offices at Seventeenth and Blake Streets, Denver, and at Salt Lake City.

Page Steel & Wire Company, Chicago, Ill., coincident with the establishing of a welding service department to handle welding rod problems for customers, announces the appointment of J. J. Flaherty to direct sales of armco, high carbon and low carbon welding rod wire. Mr. Flaherty was formerly in charge of welding for the Boston Elevated Railway. He will have headquarters at Bridgeport, Conn.

Bridgeport Brass Company, Bridgeport, Conn., has announced that Alfred W. Lockwood has joined its sales organization as a special representative, operating out of the New York office, handling brass pipe and flush valves. For some years past he was connected with Cauldwell Wingate & Company, well known New York contractors.

New Advertising Literature

Plibrico Jointless Firebrick Company, Chicago, Ill., has issued a new edition of its catalog covering the subject of furnace lining. The booklet consists of 36 pages, some of which are devoted to the installation of monolithic furnace linings and the use of this lining for furnace fronts, arches, side walls and bridge walls in boiler furnaces and for heating furnaces, baking ovens and other industrial furnace and miscellaneous applications. A copy of this catalog will be sent free on request to the company at 1130 Clay Street, Chicago.

American Bridge Company, Pittsburgh, Pa., engineers, designers and manufacturers of steel towers, poles and other steel structures, has issued its 1925 edition of "Transmission Towers," a 200-page illustrated catalog covering steel towers and poles. "General Specifications for Steel Radio Towers" is added.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, April 11, 1925 *Number* 15

Purchase of Railway Energy Requires Change in Regulation Methods

ENERGY for the operation of many electric railways is now either purchased in whole or in part from comparatively large electric power systems. Railway load is considered as bulk supply. Regulation of voltage for railway bulk supply frequently is defined by a hazy clause in the usual contract, such as "Small variations of frequency or voltage to be allowed." The result in many cases is high voltage during hours of light load after midnight and comparatively low voltage during railway peak hours. This is exactly the opposite of what is desirable for car operation. The drop in a.c. voltage from the lightly loaded hours to the peak periods may be in the neighborhood of 10 per cent. Flash-overs on owl car equipments set an upper limit to the d.c. voltage and this in turn dictates an undesirable lower potential in the morning or afternoon peaks.

When power systems were smaller and were regulated at the source for the ultimate consumer, the compound-wound synchronous converter without auxiliary means of regulation gave a reasonably satisfactory account of itself in railway service. Even with the change in power supply, the same method still prevails in many cases, despite its unsatisfactory control of voltage.

In the article in this issue Mr. Woodbridge describes the solution he has worked out for the voltage control problem as applied to the delivery of power for street railway service in San Francisco. Regulation of transformer ratios under load to offset all reasonable variations of the supply does away with the need for the compound winding, thereby giving the equipment a more drooping voltage characteristic. According to Mr. Woodbridge, this results in greater peace of mind of the operating force, which is reflected in the operating accounts in the shape of less spare apparatus required and less apparatus in service.

A Novel Method for Disposal of Substation Losses

DESIGN of all classes of rotating electrical machines ranging in size from railway motors up has tended more and more during recent years toward directed ventilation. The last type of machine to be affected by this tendency is the rotary converter. The excuse for this lag is that converters are high-speed machines which have inherently low losses and excessive windage. They can therefore stew in their own juice without ill effects. Of course windage is no aid to final disposition of the losses where large units are closely confined in small quarters, as they must be in restricted locations.

When applied to converters the real disadvantage of directed ventilation as ordinarily practiced is that it necessitates the inclosure of one end or the other of the machine, both of which should be open for most convenient inspection and maintenance. An unusual solution of this problem is described in an article by J. E. Woodbridge in this issue. With the arrangement adopted both ends are open, giving convenient access and ingress of air from the operating room, the inclosure covering the field structure, access to which is required much less frequently.

The system of ventilation in this case reverses usual practice, drawing air from a monitor on the roof into the machines and into the tops of air-blast transformers. From both of these it is blown out through ducts in the basement. This is said to keep the operating room cool and to eliminate street dirt, reducing the need of conditioning apparatus, provided offensive chimneys are not in the vicinity of the monitor. Warmth for the station when required can be obtained either by blocking or by short circuiting the ventilation path. Draft forced in this way by the centrifugal action of a converter armature, which in 60-cycle work usually has a peripheral speed of from 1½ to 2 miles per minute, is easily able to overcome the natural tendency of warm air to rise, and the restriction of windage tends toward an improvement in efficiency.

Annual Report Reflects Improvement in New Jersey

CAREFUL reading is suggested of the report of the Public Service Railway of New Jersey, an abstract of which is published elsewhere in this issue. In many respects this is an unusual statement. Not only does it indicate the measure of success that has attended the company's efforts to rehabilitate its railway lines, but it shows the extent to which the Public Service Railway is engaging in bus operation. The conversion of the system from two-man to one-man operation has been the subject of extended comment in these columns, but the report emphasizes the importance of this change and reflects in the operating statement the extent to which this and other operating economies have been carried.

As President Thomas N. McCarter has pointed out, the effect of the economies so far introduced may reasonably be expected to be more apparent in the future. Aside from these matters another fact of outstanding interest is that the expenditure charged to fixed capital for buses was $5,493,790 in 1924 compared with $1,289,011 in 1923. The need for rebuilding or replacing many of the buses taken over reflects the extent to which bus operators were living out of their capital. The 5-cent fare unit appears to be working well. It was first tried in 1923 and has been extended to additional lines during the past year. Since the period covered by the report, it has been still further extended. All in all, the report reflects great credit on the perspicacity of those charged directly with the responsibility of carrying out the program of restoring the railway to its rightful place alongside of the other successful operating units of this state-wide system, which last year did a gross business of $87,689,453 and returned net earnings of $5,583,072 available to the payment of dividends on the common stock.

Pruning the Branches to Strengthen the Tree

SIGNIFICANT among the developments of the last few years is the readiness with which a number of railway companies, both steam and electric, have sought to abandon unprofitable lines. A conspicuous example within the last month has been the Boston & Maine Railroad (steam), which has said that it wants to give up service on 186 miles of branch line railroad. Another notable example a few years ago was the Eastern Massachusetts Street Railway, which boldly abandoned a number of its unpaying branches.

Briefly the advocates of this policy reject the idea, long current by both public and railway companies, that a railway, like Tennyson's brook, must go on forever. The railway feared to allow the franchise to lapse lest the line be taken over by a competitor and operated to the detriment of the original owner. The public was opposed to such abandonment because it would leave the territory without transportation.

In the opinion of the advocates of the plan of curtailment, modern conditions have changed this situation entirely. To the average railway man, an unprofitable franchise is a distinct liability rather than an asset, and if the community served does not consider it worth while to make up for the loss from its operation it is hardly the duty of the railway company to do so. Hence, according to this policy, broadly speaking, a railway company should be as independent in such matters as a manufacturing company, which will close down an unprofitable department, or even its main factory, if times are bad.

In this automobile age, especially in the densely populated sections of the country, it is hard to imagine any community cut off from communication with the world simply because its rail transport has stopped. Automobile, bus and truck transport may not be as comfortable or as cheap as that by rail, but this is not an unanswerable argument for the indefinite supply of the better service at the expense of the railway stockholders. Much of this wayside business has gone to the rubber-tired vehicle already.

Calculating Profit or Loss on Transportation Service

DETERMINATION of profit or loss on an individual railway route, so that a decision may be made as to its retention or rejection by the operating company, is the real difficulty in the application of the rule proposed above. Where the company operates only a single line, it is no difficult matter to tell whether it is or is not covering expenses or returning a fair profit. But where the route in question is one of many, the segregation of revenues and costs is by no means easy.

On the revenue side, a number of the passengers may also ride on other routes and make them profitable, so that abandonment of the losing line may convert another line into a loser. Contrariwise, a line that apparently is making money may be doing so at the expense of some other line that could handle the business equally well and at less cost.

Expenses of operation, as well as overhead charges, can seldom if ever be determined individually for the routes of a system. The usual procedure is to make an allocation, which of necessity is based on the car-mile, the car-hour, or the mile of track. Such apportionment is at best only approximate, and may be far from the truth.

Still another complication arises in determining the value of a line. The operators of the property may feel that everything possible has been done to bring traffic to the line or to cut down expenses. Another operator, or a consulting engineer, who is able to inspect the property with a wider background, may see at once possibilities for more revenue and less cost.

Undoubtedly many of the lines which have been abandoned could have been placed on a profitable basis by the application of principles that have been worked out on other properties. In fact, there are some instances of roads which have been abandoned and have lain idle for a time, only to be taken up by others and operated with some degree of success. The decision to cease operation, then, is one that demands careful analysis, preferably by some one not too close to the immediate problem, and attention to all the points involved.

Furnishing Service Along Abandoned Routes

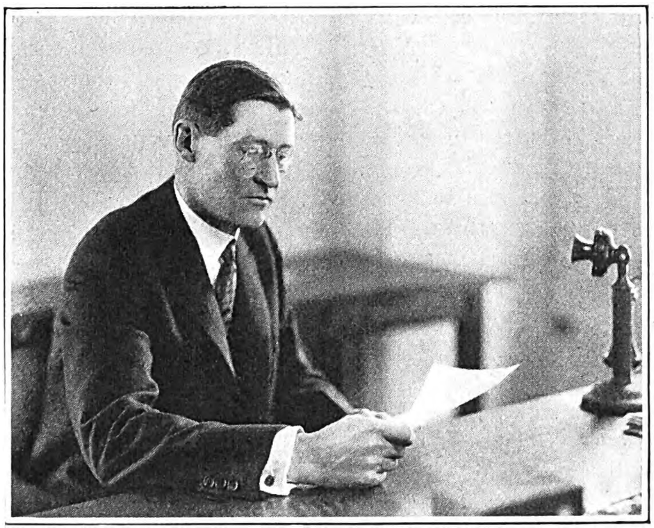
OPERATION of some form of public conveyance along a route abandoned should be preferable from the standpoint of the railway to no service at all. Even though some one else operated the line it would still be a feeder to the main road. Even though a railway may abandon operation on a branch line, for reasons set forth above, it still is often in a better position than any one else to conduct the operation of the substitute means of transport proposed. It has the organization and the transportation knowledge. Very often it has also the equipment and the means for keeping it in repair. In the Boston & Maine instance, Homer Loring, chairman of the company's executive committee, suggested that the substitute bus and motor truck service proposed should be supplied by the railway. He offered to leave the question of the amount of the service to be given and the fare to be charged in each case for the communities themselves to determine, the only provision being that the service and fares would be such that the revenue should at least equal the cost of operating the routes.

There is no doubt that there are a number of advantages in this new plan of operation—or of abandonment—if the reader prefers that word. Had it been adopted earlier in New England, some of the troubles experienced by the Eastern Massachusetts Street Railway, the Boston & Maine Railroad and the New Haven Railroad would not have occurred. In each of these cases the main routes were profitable, but great difficulties came to the property through losses incurred by operation on the branch lines. All in all, the plan has the merit of placing the cost of transportation where it belongs, namely, on those chiefly benefited.

Working with Our Shoulders to the Wheel

THE NEW MANAGING DIRECTOR of the American Electric Railway Association expresses a desire to co-operate to assist the industry in the many situations that are arising. In no sense is he to be considered a czar or a dictator to the electric railways.

The Industry's Problems Can Be Solved



Underwood & Underwood

Mr. Storrs Is Quite at Home in His New Offices

LUCIUS S. STORRS, the new managing director of the American Electric Railway Association, deplores keenly the imputation of being a czar or a dictator, which has been put on him by the daily newspapers. This was almost the first thing that he said when asked by the managing editor of ELECTRIC RAILWAY JOURNAL to talk at first hand about his new duties. Of course, it seems almost ridiculous that any such notion could exist. Those who know Mr. Storrs at all well realize that if a czar were needed he would be one of the last men who could qualify for the part. Kindly, courteous, ready to listen to the other man's point of view, and withal having a keen insight into human nature, no one seems farther from the attributes that one looks for in a czar. Rather is he a big brother, ready to give his help to those who need it.

But the idea that he is to be a czar seems to be fairly widespread. It has distressed Mr. Storrs not a little. So he insisted on talking about that first. Not only did he talk about it, but he indicated that it would please him to have it mentioned first, although from the standpoint of the interviewer it might appear to be less important than other things that were said.

"I do not regard myself as 'czar' of the traction industry, as some of the newspaper headline writers have seen fit to call me," said Mr. Storrs. "I am anything but a czar on this job. What I really am and hope to be is a hired man, worthy of his hire and helpful to the industry.

"No one could possibly resent more than I do the appellation of 'czar.' It slipped into the newspapers, I suppose, because such a term made the news stories sound well, and because four-letter words fit easily in headlines.

"Certainly it did not get into the newspapers because I or any one connected with the American Electric Railway Association by word or act left the impression that I had any idea of being an overlord of any kind."

Although he has been on the job only since April 2 and has occupied his own suite of offices since the first of this week, Mr. Storrs has already got well into the swing of his new position and is laying plans for a wide range of activities. It should be explained, perhaps, that the work which Mr. Storrs will perform will be in addition to the service heretofore rendered by the association. The position of managing director was created because of the need for the whole time of an executive experienced in financing, managing, operating, employee and public relations, and the other problems which come up from day to day on large properties. The place was not created with any thought of performing the service heretofore given by the association any differently, or in dividing the duties of the staff. They will function as previously, giving such aid to Mr. Storrs's office as will be helpful.

The familiarity of Mr. Storrs with association work has made it possible for him to step into his new position and co-ordinate his new work with existing facilities of the organization without a hitch. As president of the association he became thoroughly familiar with its machinery and personnel. Further, his devotion and attention to association affairs since leaving the presidency, in 1917, have been unflagging. Each year it has been a question as to what committees were most entitled to his services.

The open-door policy was one of the first which Mr. Storrs adopted upon assuming the managing directorship. Already executives have begun to call on him and they have found him ready and anxious to work in the rôle of friend and adviser.

Right there is the nub of the whole situation. It is just what Mr. Storrs hopes to be to the entire industry —a helpful friend and adviser. A spirit of mutual understanding and helpfulness underlies the whole ideal that Mr. Storrs has set up as his aim. His long successful connection with the industry gives him a particularly keen insight into the various problems that are developing constantly. Qualified as he is to deal with almost any situation that may arise, the managing director is, on the other hand, conscious of his own limitations. He knows that in his new endeavor nothing worth while can be achieved single-handed.

Necessarily he is proceeding slowly. Above all, he is making no promises as to what he hopes to accomplish. Just at the present time he is seeking mainly to acclimate himself. He was promised the co-operation of the industry by those who were responsible for his selection. That is all he asks. Results will depend largely on the measure of that co-operation. Said Mr. Storrs:

"It would be ridiculous for any one man to say that he alone could or would attempt to solve the manifold problems which face the transportation industry of the United States. But it is not ridiculous to say that all of us, working with our shoulders to the wheel, can solve them.

"Had the advisory council, which suggested to me that I accept the managing directorship of the industry, told me that I was expected to go out single-handed and fight the battles of traction, of course I should have refused to consider this position.

"But when the council—composed of large owners of the industry—came and offered its help and the help of the thousands of other workers in our field, then I accepted gladly, because I know that all of us, working together in a common cause, can bring order, excellent service and prosperity to the transportation business.

"I am ready to do my part to the fullest extent of my ability, and I want and need the help of every traction man."

Already there are indications that the industry is prepared to play the game along the lines Mr. Storrs has spoken of as essential to the success of the work into which he has entered. Invitations to meet railway men and requests that he attend meetings and dinners are coming in to him in large number. His engagement book is almost filled now for the next several months. While he considers that it is desirable to attend as many of these functions as possible, still he feels that in order to learn the problems which confront the industry it is necessary for him to go out into the field. Only in that way, as he sees it, will he be able to obtain the full co-operation of others. In the field it will be possible for him to meet the people with whom he will have to work out the details and get at first hand their immediate viewpoints.

OFFICE LOCATION IS CONVENIENT

The association was fortunate in securing a suite of offices for Mr. Storrs on the twelfth floor of the Johns-Manville Building, 292 Madison Avenue, immediately below the offices into which the headquarters recently were moved. This makes it possible for him to attend the meetings and confer with the association staff and committees without loss of time. His telephone is connected on the main switchboard of the association, so that he is in close touch with the members of the staff at all times. The suite consists of a large reception room, an office for Mr. Storrs, and three other offices which will be occupied by his staff as the duties of the new position increase. Just at present, however, he is being assisted only by his secretary, Walter Jerome, who was his secretary while he was president of the Connecticut Company. Mr. Jerome has worked with Mr. Storrs for a number of years, so that moving to New York meant little more than a change of his office and his telephone number, so far as his relations with his chief were concerned.

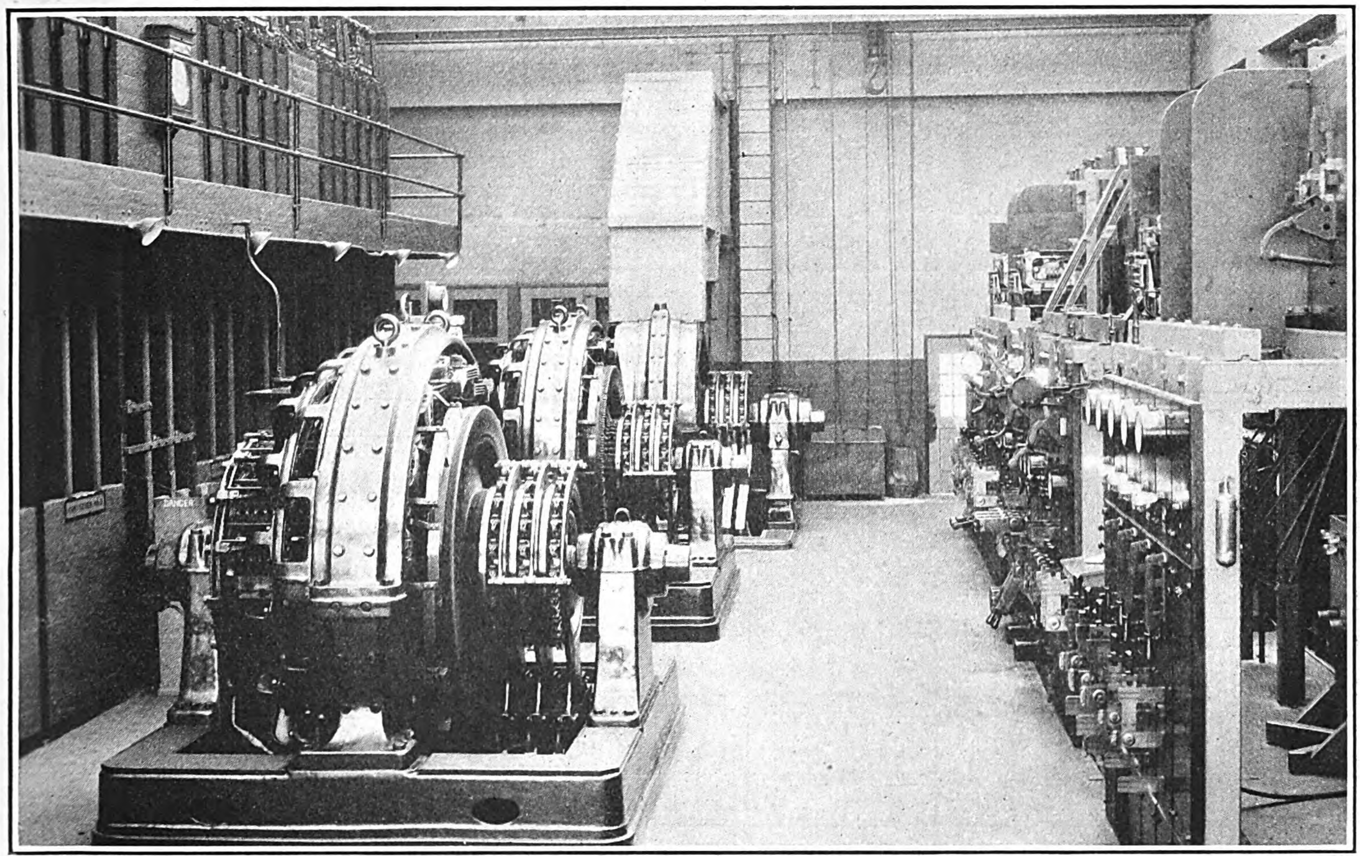
WITH THE OPENING of his new offices, Mr. Storrs has taken up the work actively. But in order to make it a success, he needs the help of all. Let every railway man keep in mind his one request:

> "I am ready to do my part to the fullest extent of my ability, and I want and need the help of every traction man."

Developments in Substation Practice in San Francisco

Method of Ventilation Differing Materially from Ordinary Practice Has Been Adopted by the Market Street Railway—Shunt-Wound Converters Give Better Service than Compound-Wound Machines

By J. E. Woodbridge
Resident Engineer Ford, Bacon & Davis, Inc., San Francisco



This View of the Downtown Substation of the Market Street Railway Shows the Two 2,000-Kw. Converters and the New 3,000-Kw. Directed-Ventilation Machine in the Rear

THE growth of the city of San Francisco has increased the demand for power to operate the cars of the Market Street Railway to such an extent as to require two additional converting units during the past year. While the demand at each of the substations has increased the additions have been made to the stations containing rotary converters, and feeder copper has been altered in such a way as to divert load from the stations equipped with motor-generators to those equipped with converters. This has been done to obtain the economies of converters, which cannot be operated satisfactorily in the same stations with motor-generator sets.

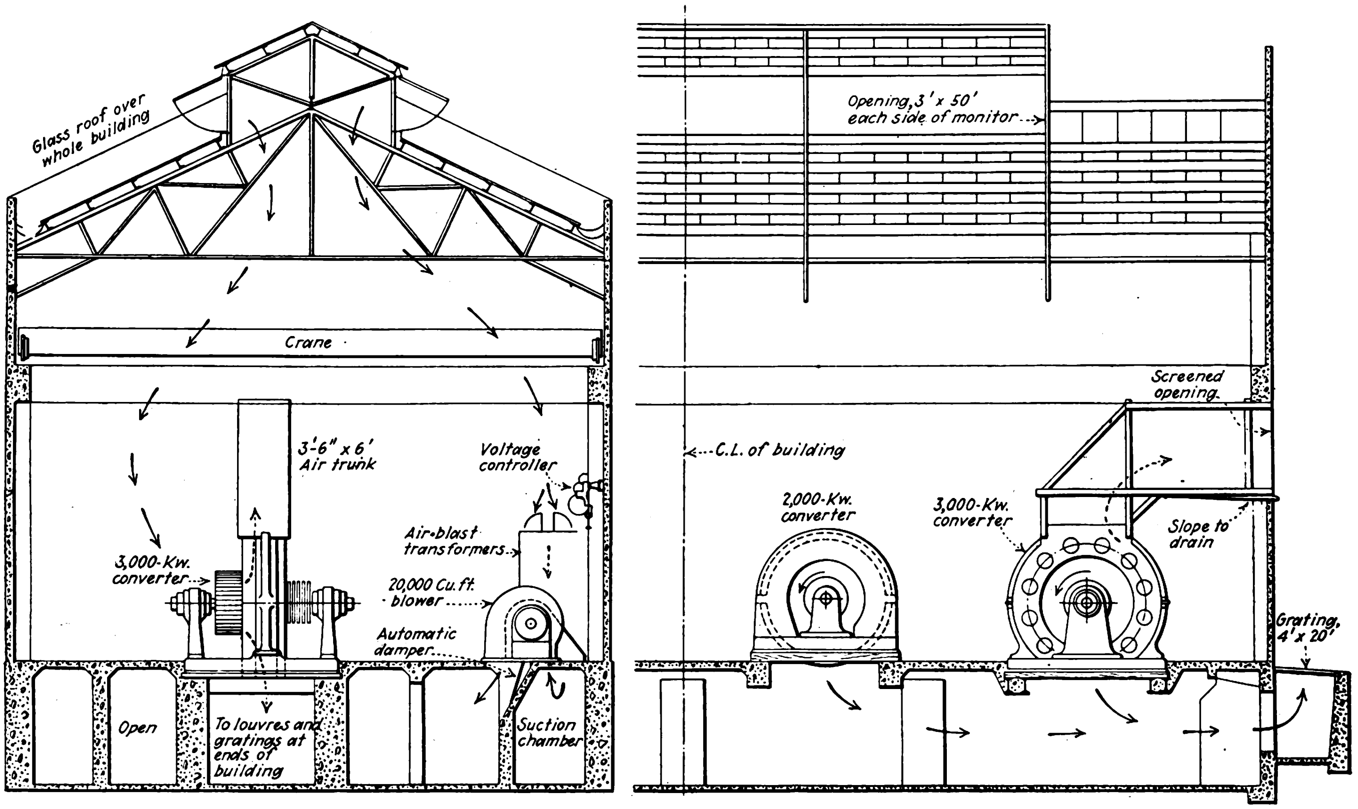
The additions have been one 3,000-kw. unit in what is known as the Downtown station, which previously contained two 2,000-kw. units, and one 2,000-kw. unit in the Eighth Avenue station in the Richmond district, previously equipped with two 1,500-kw. machines.

The Downtown substation was originally installed four years ago with several features departing from usual practice. The station was described in an article by the writer in ELECTRIC RAILWAY JOURNAL for Aug. 20, 1921, page 269. It may be of interest to note at this time their performance. The converters are shunt-wound and supplied from transformers of the high-reactance type (15 per cent) usually advocated only for compound-wound units. The drooping voltage characteristic of these machines with increase of load, and particularly with excessive overloads, has been found to be advantageous in more ways than was anticipated. Unexpected severe increases of load, such as those due to other stations backing off or dropping out multiple feeders, are relieved, and the shunt-wound converters continue to operate at times when compound converters would trip their overload circuit breakers. Instead of the constant voltage characteristic of compound-wound machines regardless of load, shunt machines tend more toward constant power regardless of external demand, reducing load swings and relieving the supply system, the machines themselves, the circuit breakers and the feeders to that extent.

The influence of the voltage droop on the car service is inappreciable, giving the effect (without the loss) of a moderate feeder drop on the short feeders characteristic of a city center. In case of unusual loads due to car congestion the reduction of voltage probably results in a saving of energy. Contrary to some theories that have been published in technical proceedings, the effect of the shunt winding on the power factor of the converter is better than that of a compound winding. Reactive factor indicators with both current and potential elements connected between the transformers and the converters, thus giving the power factor at the rings, show a variation of 12 per cent without field adjustment over the full range of load and of consequent voltage drop. This is less than the difference between 99 and 100 per cent power factor.

The actual drop of d.c. voltage of the 2,000-kw. converters installed in the Downtown station four years ago has been found on test to be 45 volts from no load to 50 per cent overload or 5,000 amp. per machine, after correction to constant impressed voltage on the transformer primaries. The regulation curve is nearly a straight line over the total range tested, departing therefrom in the direction of an increase of droop at the overload end. In actual service there is the added drop in the a.c. lines supplying the station, due to the load. No such values of drop as 45 volts occur in normal service, as the momentary load fluctuations are only about 1,000 amp. per converter. The drops obtained are comparable to ordinary impressed voltage fluctuations. But in cases of emergency, such as suddenly applied overloads, the lack of any tendency of the machines to "root in" is a notable contrast with the action of compound-wound apparatus.

The original units were also supplied with manually operated voltage controllers consisting of contactors for varying the number of turns in the transformer primaries under load. The operating department has found these controllers of great assistance in regulating the d.c. voltage to railway requirements regardless of that delivered by the supply company. The drooping characteristic of the converters and use of the controllers make it unnecessary to keep running a margin of converter capacity to absorb unexpected load swings. It also has been found possible to continue service (momentarily at reduced voltage) when excessive overloads occur either due to increase of outside demand or to the accidental interruption of service from a machine within the station. In other words, the converters inherently back away from excessive overloads.



Plan of Directed Ventilation Adopted in the Downtown Substation of the Market Street Railway

They can be backed away still further if necessary by hand. This reduces the tendency of the row of machine breakers to blow one after the other like a row of ninepins, in case any disturbance occurs that is sufficient to operate one breaker when all are well loaded. This tendency is characteristic of compound-wound equipments. A station equipped with the shunt machines can be worked more closely to its breaker settings, i.e., its overload capacity, than can a station with compound-wound units, without the increased danger, to use the vernacular, "of losing the house," with attendant delays in restoring service. The actual available increase of capacity in kilowatt-hours output per peak hour is in this case estimated at about 20 per cent.

On account of the success of these features they were incorporated in the new units. These are shunt-wound, supplied from 15 per cent reactance transformers, and fitted with voltage controllers giving a range of 12 per cent of the ratio of transformation. The series field windings of the two older machines in Eighth Avenue have been cut out of circuit. One of these machines, operating shunt-wound, gave closer regulation than the two others in the same station and tended to take all the load swings. To overcome this, the series field has been cut in again reversed.

DIRECTED VENTILATION A FEATURE OF NEW CONVERTER

On account of ventilation difficulties inherent to a station in a densely built-up district the new 3,000-kw. unit in the Downtown station has been made with directed ventilation. In order to avoid inclosing the brush rigging on either the collector or commutator end, the unit was specified open to the substation room at both ends but inclosed around the armature periphery and the fields. Air is taken from the room through the commutator spider and is discharged radially through the armature, around the field structure and through four exhaust nozzles, two opening downward into the basement and the other two upward into an air trunk carried through the end of the building.

The inclosure of the machine restricts windage, which would otherwise be excessive and reduce the efficiency, especially at low loads, as the armature diameter is 7 ft. 6 in., giving a peripheral speed of 9,400 ft. per minute. Further restriction of windage is made by a baffle plate on the armature spider, which shuts off the entry of air from the collector end. This also keeps out collector ring cuttings. All the air which enters the armature is forced to come through the commutator spider, so that it effectively cools the commutator, which is of rather unusual size for a 60-cycle railway machine, being 52 in. in diameter by 24 in. effective length, with a peripheral speed of 5,400 ft. per minute.

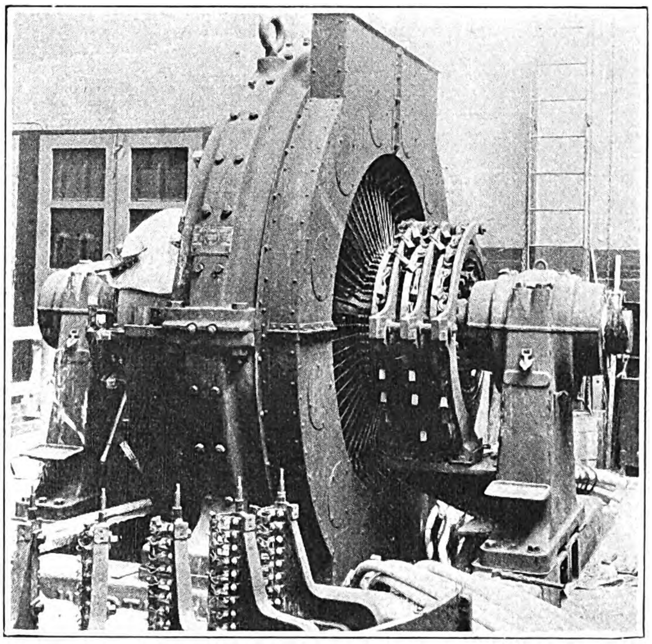
The separation of ingoing from outgoing air works satisfactorily as far as the new machine is concerned. Similar provision is now needed on the other machines since the heated air from them is now exhausted through the new machine.

Since the total station losses, with all machines at full load, amount to 500 kw., the movement of air required to avoid excessive temperature rise is considerable. For a temperature rise of 20 deg. F. the air must be moved into and out of the station at the rate of 75,000 cu.ft. per minute.

One of the older machines is now being experimentally inclosed. By this means all air will be taken, so far as possible, from above the floor and discharged below the floor. If this works out successfully it will mean reversal of the usual scheme of ventilation for such a station, outdoor air being drawn in through the roof monitor openings and discharged through the basement. To avoid passing the heated air from the air-blast transformers through the converters, the usual path of the air through them has also been reversed, the air being drawn in from the room through the tops of the transformers and discharged through their bases into a suction chamber, instead of a blast chamber. From there it is drawn by fans and discharged into another portion of the basement, where it joins the discharge from the converters and is delivered outdoors. This arrangement avoids discharge trunks over the transformers, where they would be in the way.

The converter frames are insulated from ground for the purpose of reducing the risk of a short circuit in case of a flashover from the positive brush rigging to the frame. The air trunk for the machine provided with directed ventilation is built of wallboard on a timber frame. This construction eliminates any chance of a ground and reduces the noise, which would be aggravated by a metal trunk. On account of its height the new 3,000-kw. unit is set with its base below the grade of the floor; an asphalt floor provides insulation at this point as well as safety to operators in case of an internal leak to the frame. The asphalt flooring has proved highly satisfactory. The same type of floor has now been laid in the Eighth Avenue substation.

The means usually adopted for starting small converters was chosen for the 3,000-kw. machine—namely, a starting switch in the secondary leads. This was found to be cheaper and simpler when the difficulties inherent to switching such large currents had been solved. The starting switch, rated at 4,000 amp. on each of its three poles, is of the double-single type operated by two handles, one-half of the blades making contact in the starting position and all of them in the running position, the two sets of blades being so mounted that they cannot make simultaneously both running and starting contacts. This division of the switch into two separately operated parts makes it easy for one man to handle.

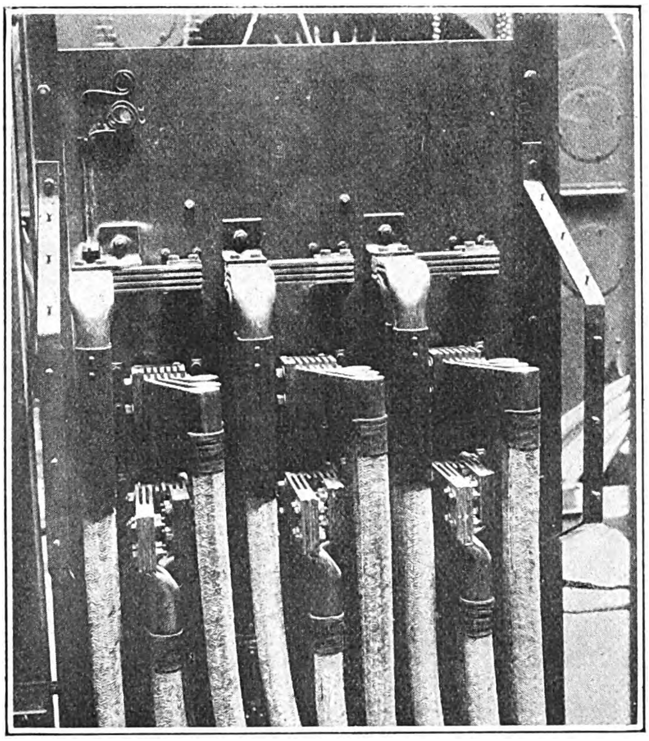

The Nozzles for Directed Air Discharge on the A.C. End of the 3,000-Kw. Converter Are Shown in This Picture, Taken During Erection. The Nozzles on the D.C. End Are Not Yet in Place

With the controller set for minimum delivered voltage the starting current of the 3,000-kw. machine is approximately 5,000 amp. per collector ring, or 105 amp. at 11,000 volts or 2,000 kva. This heavy secondary current is handled by the starting switch without burning or flashing. This current starts the machine from rest, and brings it up to synchronous speed in 38 seconds.

Sufficient study was made to determine that the low-tension connections between the transformers, the 3,000-kw. converter and the switchboard could be made more cheaply with cable than with bars, and that they could be made more safe. The total cross-section of copper to and from this converter aggregates 60,000,000 circ.mil. This is made up of three 2,000,000-circ.mil cables per phase of the six-phase circuit and six 2,000,000 cables for each d.c. terminal. Cables with a total cross-section of 48,000,000 circ.mil run to the starting switch for this machine. A careful design of the switch terminals was necessary in order to get the cables to them with proper clearances and room to reach bolts and nuts with wrenches.

The modifications of the auxiliaries of the new equipment from those of the older units are as follows:

The field rheostats are connected between the shunt fields and the ground side of the machines instead of between the shunt fields and the positive side. This change has been made in order to avoid the dangers of a violent short circuit in case of failure of the insulation of a field rheostat. The field rheostat of the 3,000-kw. machine is motor driven on account of its size, and indication of the rheostat resistance is given on the switchboard by means of a d.c. voltmeter connected across it. Incidentally this gives an added means of checking the polarity when starting. On account of the practical impossibility of calibrating the scale markings of large overload d.c. circuit breakers the breaker of the 3,000-kw. machine is made automatic on overloads through a relay operated from the shunt. This relay can be checked at will with a millivoltmeter. The relay in turn acts on the low-voltage release attachment of the breaker.


Rear View of Low-Voltage Starting Panel for 3,000-Kw. Converter, Showing Connections to 24 Cables, Each of 2,000,000 Circ.mils

The power factor of the new machines is determined by means of reactive volt-ammeters instead of reactive-factor indicators as with the older machines. The former instrument has simpler connections and does not give exaggerated indications at low loads. In order to avoid errors of current transformers in close proximity to heavy leads the reactive instrument is connected to a primary current transformer but takes potential from the secondary side of the main transformers. At an indicated power factor of unity this segregates the magnetization of the transformers to the converter, and the balance of the reactive component set up by the transformers to the line.

The Downtown substation was originally equipped with low-speed d.c. feeder circuit breakers. Several flashovers occurred due to the low resistance of short circuits when contact wires broke down, even with cast-grid protective resistances in the worst feeders. With the new equipment five high-speed feeder breakers were installed and all feeder protective resistances were removed. No flashovers have occurred since the new breakers were substituted, although there have been cases of trolley wires down not far from the substation, including a case when there was only one machine in operation.

One of the high-speed breakers supplies a so-called hospital bus to which any feeder can be transferred. This breaker is regularly used for testing suspected feeders, so that all danger of fireworks is removed. While the high-speed breakers operate frequently, due to sudden rise of current suspected to be far below their setting, they are readily restored within a few seconds, being of the trip-free type, and the frequent operation does not deteriorate the contacts or call for undue renewals.

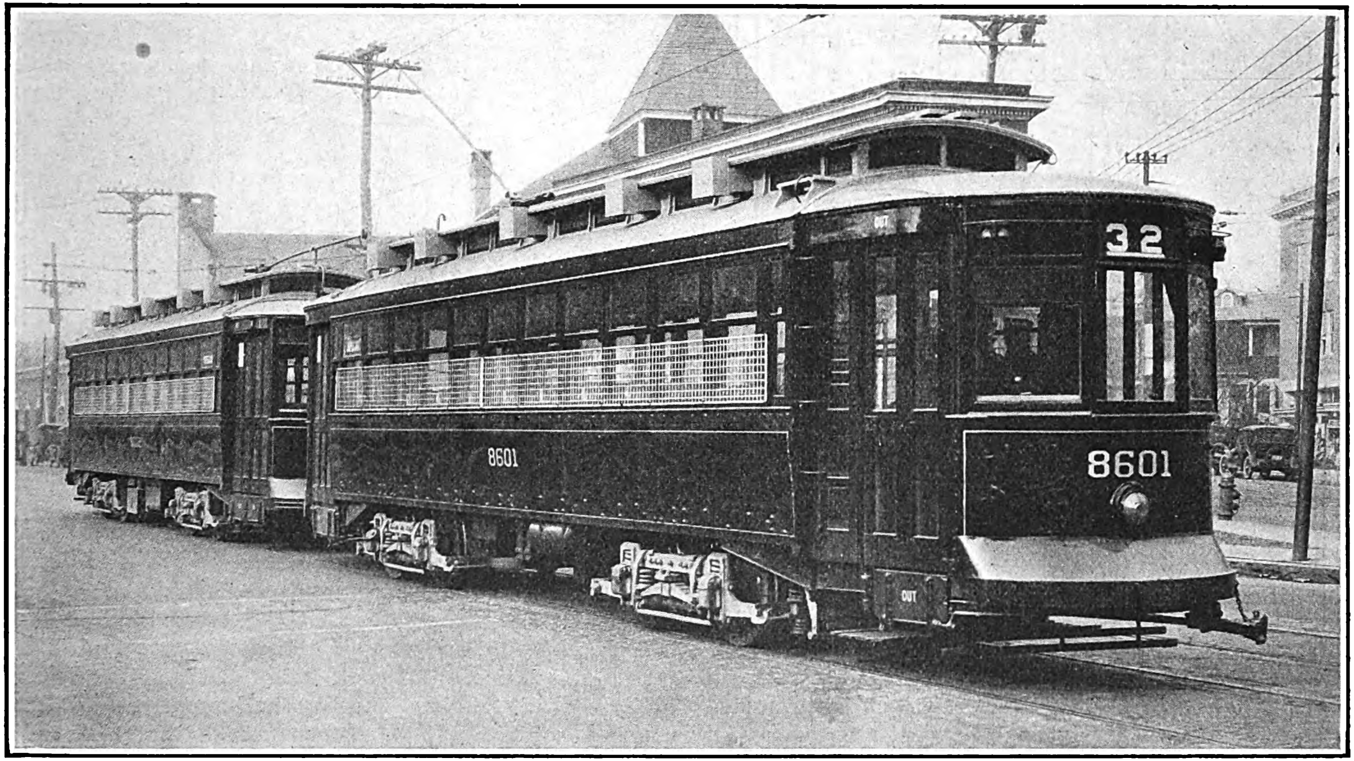
A few ideas have been adopted from automatic substation design, although the operation of this equipment is manual. The closing wire of the electrically operated oil switch supplying any converter is carried through interlocks so that the oil switch cannot be closed unless the converter brushes are raised and the transformer dampers are open. The low-voltage release of the d.c. circuit breaker is also supplied through an interlocking contact on the brush-raising mechanism so that the breaker will not remain closed unless the brushes are lowered.

The fans for the air-blast transformers in the Downtown substation are driven by 550-volt d.c. motors in order to simplify their control and to permit the use of lower speed and higher efficiency than can economically be provided with induction motors. A small range of speed regulation by armature resistance is also provided for reducing fan losses when less output is required as when running one converter. A Franklin air-pressure relay is so connected as to ring an alarm in case the air pressure fails. The relay circuit is carried through an extra pole on each fan motor switch to stop the alarm when the station is shut down and to close the alarm circuit positively when the station is started.

In the Eighth Avenue station the blowers are induction-motor driven. Since they cannot be started until a converter is in operation, a Franklin air-pressure relay is connected through auxiliary switches so that the alarm will not ring if the station is shut down, but it will ring if any converter is connected to the direct-current bus with no pressure in the air-blast chamber.

Return current from pipes, cable sheaths and carrier tubes in the area where such portions of the circuit may become positive to ground is brought in to the Downtown station through cables aggregating 3,000,000 circ.mils. These are connected to the negative busbar through switches intended to be opened when the station is shut down. Auxiliary switches are so connected as to ring an alarm if any converter is connected to the d.c. bus, and the drainage switches are open, or if all converters are shut down and the drainage switches are closed.

The extensions of the stations and of the conduit system, the installation of the equipment and the alteration of the feeders were carried out under the supervision of Ford, Bacon & Davis, Inc., consulting engineers to the railway.



One Permanently Coupled Train of This Type Is Equipped with Material that Is Left Over from the Construction of Two Articulated Units

Rush-Hour Train Operation in Baltimore

United Railways & Electric Company Plans Soon to Have 292 Two-Car Units in Service—Permanently Coupled Trains Utilizing Remodeled Open Cars Are Equipped with Surplus Material from the Construction of Articulated Units—Multiple-Unit and Trailer Trains Are Also Used

EXTENSION of train operation by the United Railways & Electric Company of Baltimore, Md., has been found an effective means of reducing platform expense during rush hours. In recent years the morning and evening peaks have become sharper. The question of securing trainmen to operate the large number of tripper cars has consequently become more pressing. Two-car trains operated by three men are now being used in large numbers by this company to provide extra rush-hour capacity without a proportionate increase in labor cost. To carry this idea a step further, two-man articulated units are being built.

When the present building program is completed the railway will have 292 two-car units of various types. The following figures show the number of each type, the listing being in the chronological order in which they were placed in service:

TYPES OF TWO-CAR TRAINS USED IN BALTIMORE

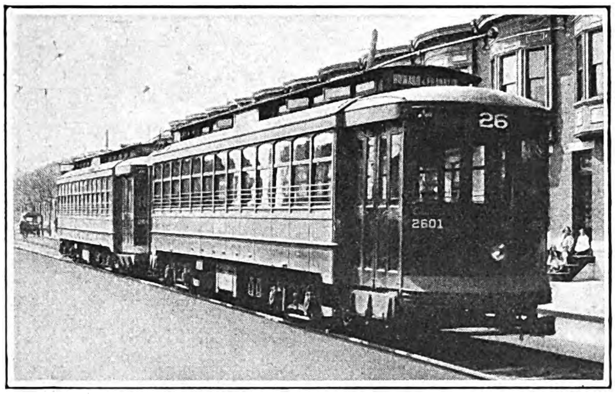
Trailer trains (100 trail cars and 105 motor cars)	100
Multiple-unit two-car trains	25
Peter Witt multiple-unit train	1
Articulated units	*110
Permanently coupled two-car train (experimental)	1
Permanently coupled two-car train	*55
Total	292

*Now under construction.

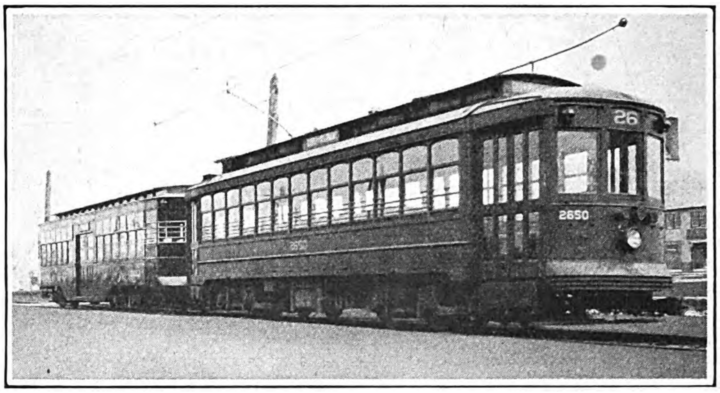
After a thorough study of the operation of articulated cars in Milwaukee it was decided to construct one such unit in Baltimore as an experiment. Two of the company's standard semi-convertible cars, each seating 44 passengers, were used. One vestibule was removed from each car and the truck nearest the removed vestibule was taken away. The two cars were then joined together permanently with a new truck common to both cars, thus forming a three-truck train. A hollow steel drum mounted directly over this truck forms a covered passageway between the cars. Rubber buffers form a tight joint, preventing entrance of air. This passage can be safely negotiated on any piece of straight or curved track on the system. A brief description of these cars was published in ELECTRIC RAILWAY JOURNAL for Dec. 6, 1924, page 964.

The leading body is provided with longitudinal seats, while the rear body is equipped with the maximum possible number of cross seats, together with a semi-circular seat on the rear platform. The total seating capacity of the articulated unit is 87.

The motorman is located at the center of the front platform and controls the double doors at that end, through which all passengers enter the car. The conductor is located at the front right-hand corner of the rear car, just back of the passageway between the first and second bodies. He collects all fares as passengers step from the drum into the second car and controls a double exit door at the front of the second car, through which all passengers leave the unit. Passengers in the forward body are, therefore, non-paid passengers, while those in the rear body have paid.



Multiple-Unit Cars Are Operated Singly During the Day and in Trains During the Rush



Standard Motor and Trail Car Train Used in Baltimore. A Second Trail Car Is Added When Riding Is Heavy

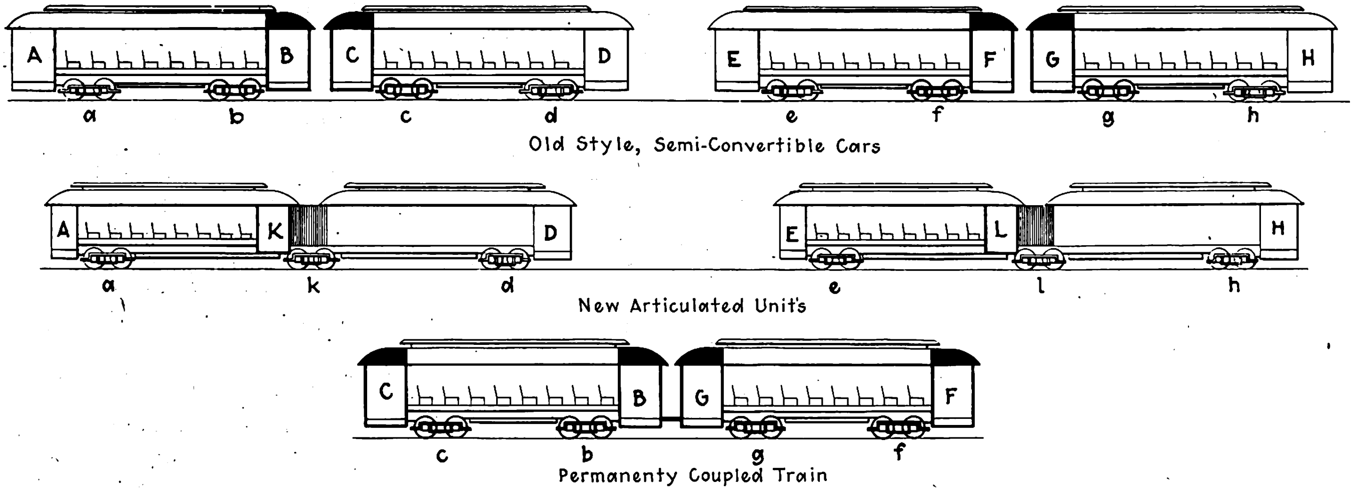
An emergency controller and air brake valve have been placed in a concealed position under the rear semi-circular seat for emergency operation in the reverse direction, and for shifting. A cadmium yellow color scheme used by the company to distinguish front-entrance cars has also been carried out in the articulated units.

The sample articulated car was placed in service in September, 1924, and its operation was closely watched for several months. The trial was entirely successful and construction was begun on nine more articulated units. It is expected to carry out an extensive program for building articulated cars during 1925, with the intention of constructing 110 units eventually. These articulated cars not only enable the company to handle its rush-hour traffic with a much smaller number of platform men than single cars would require but there is also a considerable economy in power and maintenance.

After constructing an articulated car there is left over as salvage two vestibules, two trucks, cross-seats from the leading body, motors, controllers and many other miscellaneous parts. One of the problems which had been confronting the company for several years was what to do with the 110 twelve-bench open bodies, which were no longer being used in summer service. These bodies had no equipment, the trucks, motors, controllers, etc., being transferred each spring and fall from and to the same number of closed bodies. The articulated car program suggested a plan whereby it would be economical to utilize these bodies, remodeling them into closed cars. Utilizing the salvaged parts on the open car bodies, a comparatively small additional amount was needed to close in the sides, build windows, etc., so as to turn out a first class closed car similar to the company's standard equipment.

One of the bodies was remodeled along with the construction of the sample articulated car and was placed in service on Dec. 8, 1924. This car was also observed very closely and was pronounced to be a complete success. It was later decided that these remodeled open cars could be successfully operated as two-car trains, coupled together permanently, and thus aid materially in the scheme of reducing the number of platform employees required for rush-hour service. Consequently, after the first open body had been converted into a single closed car, the succeeding bodies, as remodeled, were permanently coupled to form two-car trains. This necessitated multiple-unit instead of Type K control and different motor equipment, but it was found that the reduction of one employee per train would much more than offset the additional expense. Structural difficulties prevented the use of these bodies as articulated cars or there could have been a still further reduction in platform labor. The first permanently coupled two-car train of this type went into service Feb. 28, 1925.

How the various surplus parts of the cars made into articulated units were utilized in building the permanently coupled trains is shown in an accompanying diagram. The two vestibules remaining from the two semi-convertible cars forming an articulated unit were



One Permanently Coupled Train and Two Articulated Units Are Made from Four Semi-Convertible Cars and Two Open Car Bodies

Letters indicate the original and final positions of trucks and vestibules. K and L are new center-exit doors; k and l are new trucks.

Cross seats are removed from the first cars of the articulated units and placed in the open car bodies of the permanently coupled train.

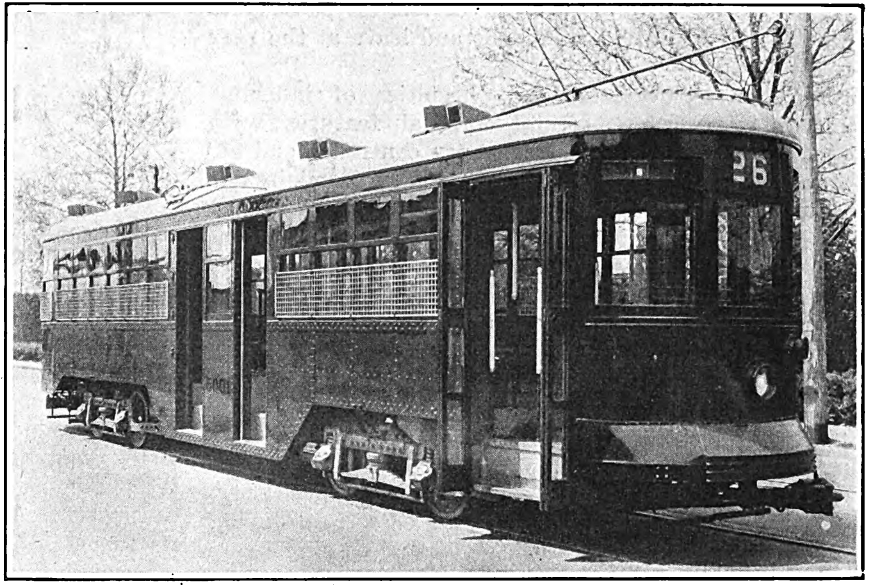
used on the two ends of the open car body. Thus the construction of two articulated trains provided sufficient vestibules for one permanently coupled train formed with two open car bodies. Similarly the two inner trucks from the pair of semi-convertible cars were used under each of the old open cars. The cross seats removed from the leading body of each articulated unit were installed in one of the open cars.

Old GE-80 motors with which the semi-convertible cars were originally equipped were retired, and Westinghouse 306-CV4 motors were installed on both types of remodeled units. On the articulated units two motors are mounted on each of the end trucks. The center or pivot truck is a trailer. On the permanently coupled trains the same change was made from GE-80 motors to Westinghouse 306-CV4 and one motor was placed on each truck.

The idea of the permanently coupled two-car train did not originate with the remodeled open car construction. Previous to any consideration of such cars, it was decided to experiment with a permanently coupled two-car train, using closed cars which were the mates of the old twelve-bench open cars. These cars were small double-truck cars having a seating capacity of only 36 passengers, on longitudinal seats. They were hand-brake, two-motor cars, with old maximum traction type trucks.

Two cars of this lot were coupled together permanently, equipped with multiple-unit control and air brakes. The two center vestibules had to be lengthened to provide double doors for entrance or exit. This sample train was placed in service Nov. 24, 1924. While its operation has been entirely successful, it is doubtful if any more trains of the type will be built, as the expense involved very nearly offsets the saving effected through the elimination of one platform employee.

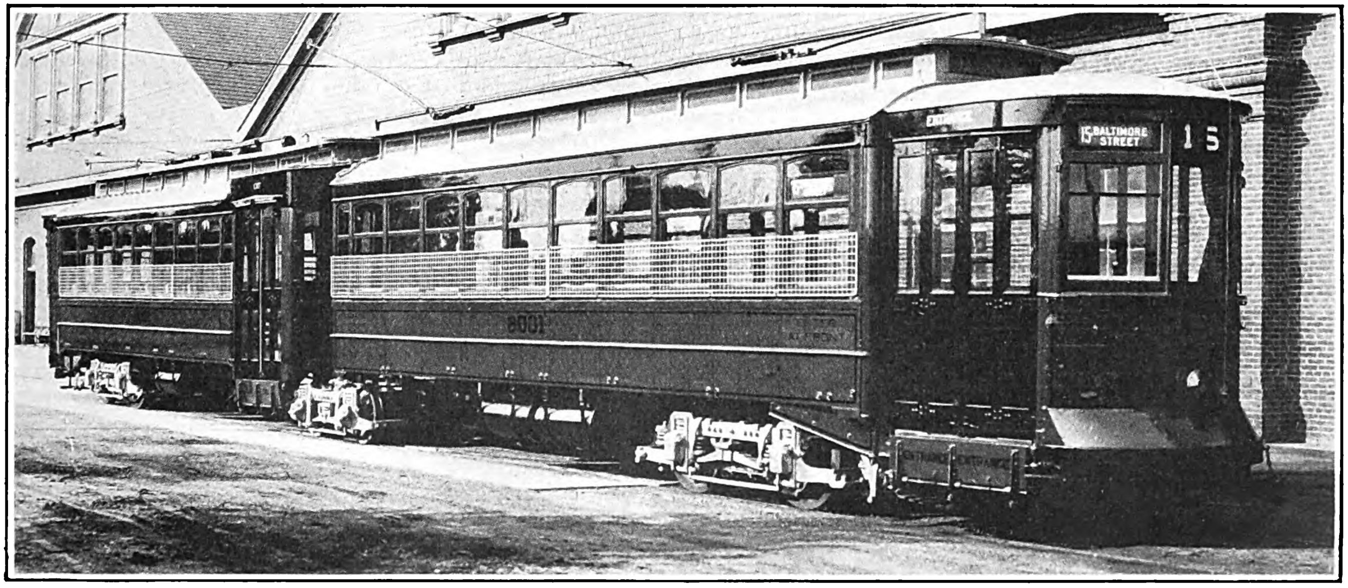
On both of these permanently coupled trains the leading car operates as a standard "pay-enter" car. Passengers board at the rear and leave at either the front or rear. On the rear car passengers board and leave at the front platform, paying fares on the "pay-enter" plan. Both types of permanently coupled trains are equipped for double-end operation.



Multiple-Unit Peter Witt Car. When Operated as the Second Car of a Train Entrance and Exit Are by Center Doors

Prior to the decision to use articulated units, the company considered the feasibility of operating Peter Witt multiple-unit trains. In the spring of 1923 an order was placed with the J. G. Brill Company for the construction of two sample Peter Witt cars, and an option was taken on 48 others, should the two sample cars prove successful.

These cars in many ways are a distinct departure from the railway's standard and also embody some features that are new to the Peter Witt design. They may be operated either as single cars or as two-car trains. Passengers enter through double doors on the front platform and leave by two separate doors at the center. The conductor is stationed between the two center doors and collects fares as passengers pass him, either to take seats in the rear half of the car or to alight from the forward half. When one of these cars is operated as the second car of a two-car train the same



The United Railways & Electric Company Is Building 110 Articulated Units of This Type method of fare collection is used, but all passengers enter at the forward center door and leave at the rear center door.

In order to overcome the difficulties of inflexible single-end operation, several unusual features were added to these cars. An emergency controller and air brake valve are placed beneath the rear semicircular seat under a removable center section. An emergency door has been provided at the left side of the front vestibule. This can be worked manually from an emergency conductor's station just inside the front platform, thus permitting operation of the car in the reverse direction.

These cars were placed in service on May 12, 1924, and proved to be very satisfactory operating singly. On Aug. 25, 1924, they were transferred to another line, where they could be used to advantage as a two-car train during rush hours. They have been operating on this line ever since, running as a train during the morning and evening rush hours and as single cars during the mid-day. Although they have been entirely successful, the company did not exercise its option on the other 48 cars, preferring to build articulated units.

CARHOUSE LOCATION AIDS TRAIN OPERATION

A factor that has had an important bearing on the use of trains in Baltimore is the arrangement of routes and carhouses. There are in all 34 routes and 22 carhouses. The former are laid out in such a way that in many cases one route furnishes short line service on another route. Carhouses are comparatively small. Their locations are such that a majority of the lines have carhouses near both ends. Ordinarily both carhouses on a single line are under the same supervisor. This makes it possible to haul the trailers in the morning in the direction of the rush and drop them at the carhouse at the other end of the line. In the afternoon this process is reversed.

On the Sparrows Point line, where the riding is exceptionally heavy, two motor cars haul a single trailer in the rush hours. The train commences its outbound trip with one trailer, and when passing a carhouse in the outskirts of the city picks up a third car. The fact that many of the workers in the steel plants which this line serves live in the vicinity of the carhouse insures a good load for the additional car. This three-car train operation is convenient also on summer Sundays and holidays, when large crowds are going back and forth between the city and the beaches.

Operation of a second short line over parts of a long route facilitate the use of the permanently coupled trains and the articulated units. Rush-hour traffic requires roughly 2½ times the number of cars operated during the day. During the afternoon rush it is customary to transfer all the single units operating on a long route to the short line using the same track. An equal number of articulated units or trains is then placed in service on the long route, thus providing double carrying capacity on both routes. When the rush is over the large units are taken off and the single units are transferred back.

The Department of Public Works, Detroit, is using one of the trolley supply cars of the Department of Street Railways to haul filling material. The supply car has been reconstructed to hold about 50 cu.yd. Five other cars will be fitted up in the same way.

Control Equipment Mounted Inside Baggage Cars

Two New Cars of the Michigan Electric Railway Are Arranged to Haul Trailing Loads of 1,050 Tons in Addition to Baggage Compartment Load

BY C. R. SEYBOLD
Westinghouse Electric & Manufacturing Company

TWO new baggage cars have recently been placed in service by the Michigan Electric Railway, Jackson, Mich. These were built especially for service on the company's southern division and they will be operated between Jackson and Kalamazoo. The mechanical equipment for the cars was manufactured by the J. G. Brill Company and the electrical equipment by the Westinghouse Electric & Manufacturing Company. The cars were built by the Michigan Electric Railway in its shops at Albion, Mich., and the electrical equipment was installed by the regular shop forces of the railway company.

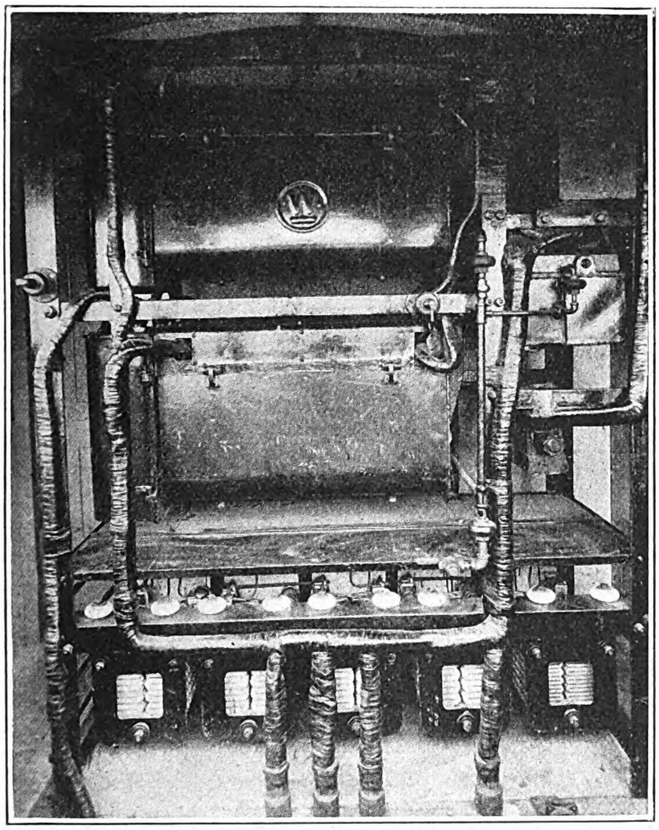
Engineers of the Michigan Electric Railway adopted an unusual scheme for mounting the control apparatus. Instead of the usual under-floor arrangement, this apparatus, including grid resistors, is mounted inside the car. A steel frame extending crosswise at one end of the car serves as an equipment support. This frame is 5 ft. 3 in. wide, 6 ft. high and extends 2 ft. 3 in. lengthwise of the car. A wooden partition separates the equipment and motorman's compartment from the baggage compartment. The neatness and compactness of the arrangement are shown in the accompanying illustration.

The grid resistors are located at the bottom of the frame near the floor. Directly above are mounted the two switch boxes, each containing eight Westinghouse pneumatic unit switches, arranged to give sixteen notches, including tapped field running points. The reverser, fuse box, motor cutout switches and overload relay are located at the side of the groups. The main knife switch, control resistor, lightning arrester, junction box and feed valve for air control are placed on the frame in readily accessible positions. Master controllers are provided in the cabs at either end of the car so as to permit of double-end operation.

The railway expects to obtain a number of advantages from this layout which will result in decreased maintenance and depreciation charges in the coming years. Apparatus mounted on the inside is free from wheel wash and road dirt. The deteriorative effects of weather are also minimized and all parts are accessible for inspection and maintenance. The total space taken up by this equipment is 78 cu.ft. This is less than 3 per cent of the total cubic space in the car available for baggage or express.

The baggage cars are equipped with Westinghouse type 562-A slow speed motors geared 17:60 to 37-in. wheels. Helical gears are used. Each motor develops 100 hp. at 600 volts. The slow-speed characteristics of this motor permit heavy loads to be hauled without undue load on the substation equipment. Smooth acceleration is obtained by the use of the sixteen-notch control.

The total weight of the new cars is 73,350 lb. Distribution of this weight among the different parts is shown in the following table:



Arrangement of Control Equipment Inside Car

Electrical equipment	23,000
Trucks, J. G. Brill M. C. B.	23,000
Air brakes, Westinghouse WD-3-F	3,100
Heaters	250
Car body	24,000

The cars contain 2,084 cu.ft. of baggage space and have capacity for carrying a load of 50,000 lb.

Since both third rail and overhead trolley are used on the southern division, it is necessary to have both trolley poles and third rail shoes. Main cable is brought from these current collectors to the jaws of a single-pole, double-throw switch. This is operated manually by the motorman to accomplish changeover.

These cars will develop sufficient tractive effort to haul considerable trailing load with relatively low current demands. When the baggage compartment is loaded to capacity they will start and accelerate a trailing load of 1,050 tons on a straight and level track, assuming 25 per cent adhesion, without excessive strain on the motors. Under similar conditions, with 600 volts on the trolley, a speed of 13.5 m.p.h. can be reached with this load.

Treatment of Burns

The Most Frequent Causes of Burns on a Public Utility Property Are Enumerated, and Helpful Suggestions Are Given About Each

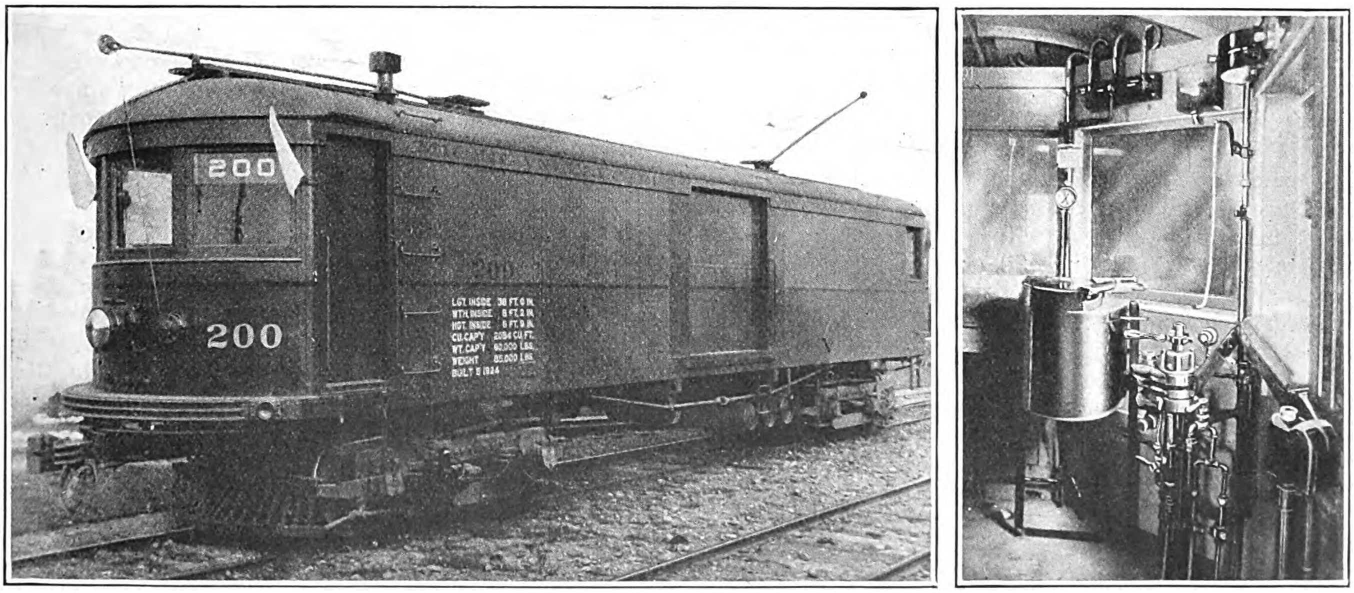
BY J. J. WYMER, M.D.
Surgeon New Orleans Public Service, Inc.

ONE of the most frequent types of injuries which confront the surgeon of a large electric railway or other public utility corporation is that of burns. There are so many causes that hardly a week passes but some employees will present themselves to the medical department for treatment for burns. I will attempt briefly to consider all of the types that I have most frequently met and will treat them under three distinct headings: (a) The causative agent, (b) the anatomical parts involved, and (c) the extent of destruction of tissues.

Burns may be caused by chemicals, fire, steam or hot water, hot or molten metals, heat rays as from the sun or X-ray, welding and other machines, brush burns, and electric flash or contact with charged wires. The parts involved may be the entire body, or may be limited to any member.

To permit a wide degree of differentiation I have adopted a classification of six degrees of extent of burns as follows:

1. Simple redness or erythema.
2. Involving the superficial layers of the integument down to corium and associated with blisters.
3. Involving all the true skin and down to the muscles and associated with large blisters.
4. Destruction of all the tissues involving the muscles.
5. Destruction of the tissues down to and involving the bone.
6. Total destruction of the member (charring).



At Left, New Baggage Car of Michigan Electric Railway with Control Equipment Mounted Inside. At Right, Operating End of Car

The following is suggested treatment for each of the kinds of burns enumerated:

Chemical Burns—Those most frequently met with are the result of acids and alkalies such as muriatic, nitric and sulphuric acids and caustic potash or soda (lye). They are found in garages where the testing and filling of batteries for autos is done, and in the meter repair rooms where old meters are cleaned during the process of repair.

As a rule these wounds involve the eye and face and occasionally the hands, and for the most part they are of the first degree. The burn may be limited as the result of prompt counteraction by another worker with a neutralizing agent which should always be kept near at hand. These wounds will result in a disability of from three to five days and are serious only where first-aid treatment has not been available.

Fire Burns—These usually result in the power station (or in the manufacturing department of a gas company) and are the result of explosion of gas in the gas generators or back fires in front of the firedoors of a steam boiler. Electric flashes also cause this type of burn, but I will take these up under the subject of electric burns. One great danger from fire burns is the possibility of clothing catching fire and the victim fanning the blaze in an attempt to get to someone who can assist him. If the clothing is not ignited, the burns will be limited to the exposed areas, such as the hands and face, and they rarely go beyond the third degree. Should the clothing catch fire and the trunk be burned, even though in a minor degree, caution should be used in giving a prognosis due to possible complications such as pneumonia, inflammations of the stomach and intestines, occasionally resulting in ulcers or acute nephritis (Bright's disease). These may be caused either from the elimination of the poisons or damage of the organs themselves and acute inflammation, and any one may terminate the case fatally, even though the injury at the beginning did not appear to be bad.

Minor fire burns may result from acetylene gas welding machines, explosions during the installation of gas meters, the stripping of gas meters during the process of repair, or the explosion of gasoline furnaces. The eyes appear to be the most frequent of all organs injured. The hands and face come next. The period of disability from these burns will extend from one day to three weeks.

Steam and Hot Water—Burns from this cause are usually of various degrees in the same individual and will run the gamut from simple erythema to death. The degree of the burn will depend on the time of the exposure. For instance, in the breaking of a high-pressure steam pipe, the victim may be caught in a trap, in which event he will be rendered unconscious and in a very short time will receive fatal burns. In another instance he may be able to get away with a superficial burn only. It must be borne in mind that this type of burn will frequently involve large areas, and even though superficial a very guarded prognosis should be given, as burns involving two-thirds of the body, even when of the first degree, may prove fatal. When a limited area is involved the disability will be from one to three weeks.

Hot and Molten Metals—The burns resulting from hot or molten metals are always deep and frequently are of the fifth degree. Most of the cases met with in my work are from hot solder, flying pieces of iron in the blacksmith shop and small ends of a welder's "stick."

These burns are generally about the feet, and the metal falling into the shoe results in a very deep burn before the victim is able to get the shoe off. Little or no bleeding results while the hot metal burns its way deep into the tissues. As a result, these burns are very painful, often requiring opiates. They are very sluggish in repair and frequently require treatment for five or more weeks.

In foundries and smelters, the wounds caused by these burns are frequently so extensive as to cause loss of life or limb.

Heat Rays—The burns resulting from heat rays are for the most part never beyond the third degree and will not cause disability.

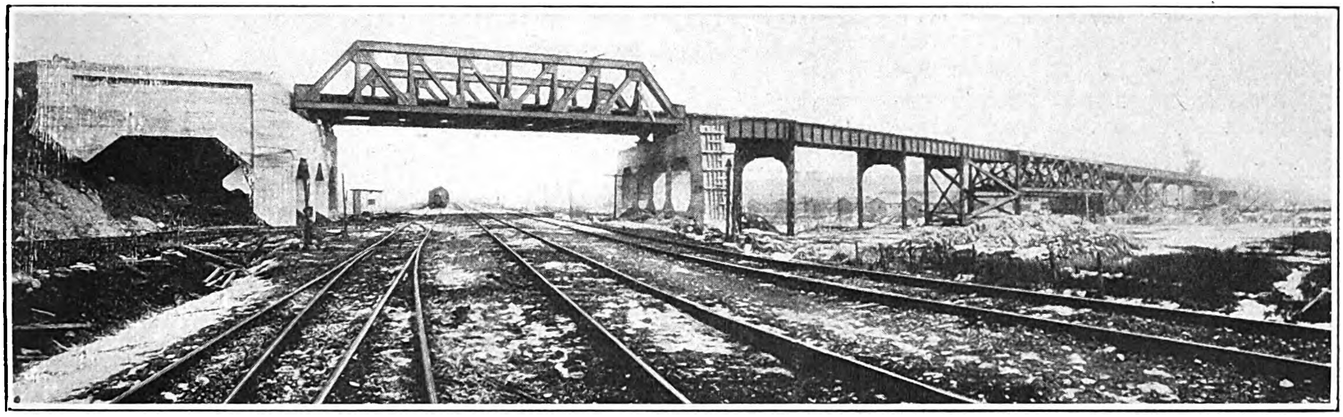
Brush Burns—This is a term used to describe certain types of injuries resulting from a fall, the skin being scraped off from contact with a rough surface. While they are very painful at first, unless infection complicates the injury there is no disability, even though large areas are involved, and the patient makes a speedy recovery.

Electric Burns—This type of burn is the most deceptive with which I have had to deal. In my experience I have to differ with some authorities who believe that the extent of the burn depends on the duration of the contact and the voltage of the wire where the contact is made. I have seen many cases where individuals burned by 2,300 volts suffer only slight lesions, while others, under similar conditions, get very extensive ones. I quote from Moorehead: "An electric burn is an index of resistance of the tissue affected, and always indicates that the full strength of the current has not been received." In this I cannot agree with Dr. Moorehead, as I have seen very severe burns where the patient succumbed to electric shock, and others where the leg and hand would become gangrenous 12 in. above the point of contact and recover. It is also true that I have seen fatal cases with only slight evidence of contact, and it was only by careful search that I was able to discover a burn at all.

The electric burn is not nearly as painful at the beginning as the other types, and I have not been as successful in getting rapid responses to treatment as is claimed by some authors. Granulation has always been sluggish regardless of the treatment and frequently had to be stimulated and assisted for many days. One noticeable feature is the smoothness of the scar as well as its pliability. Contractures are not so marked, and the patients often get nearly complete restoration of function even in the deep types.

TREATMENT

No attempt will be made here to enter into the treatment as every textbook on surgery carries a complete chapter on the subject, but I cannot refrain from expressing a few words on the first aid. Every first-aid kit should be equipped with a lubricant. Personally I prefer plain or borated vaseline in sealed collapsible tubes. Every case, regardless of how slight it is, should be treated with this dressing and referred to the medical department for anti-tetanic serum. Ambrine presents one of the safest, least painful and most easily applied of all dressings in the surgeon's office. I never wash a burn, but will clean the tissues in the proximity, removing grease, etc., with benzine and alcohol. I never use iodine on a burn.



1,000 Ft. of Bridge Work, Reaching a Maximum Elevation of 38 Ft. Above the Surrounding Surface Level, Is Employed to Cross the Sanitary District Channel and the Various Railroad and Street Crossings at This Location

North Shore Line Completes $3,000,000 Extension

The Route from Howard Street to Niles Center Includes a Wide Variety of Construction, Including Open Cut, Earth Fill, Overhead Bridge and Surface Track—Trains Are Being Operated Temporarily by Chicago Rapid Transit Company

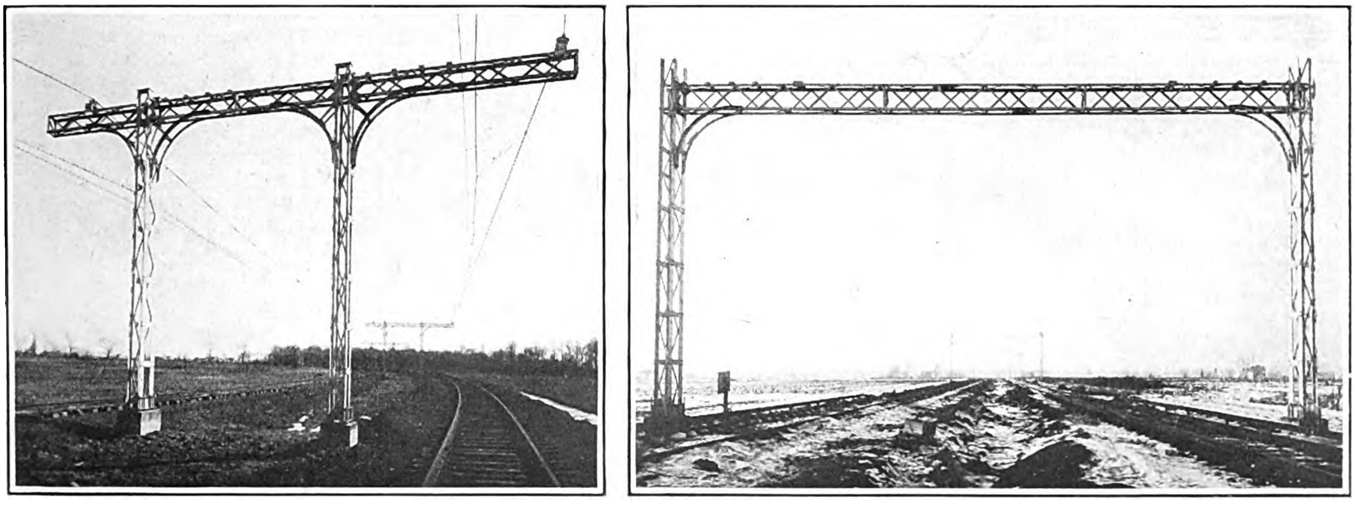
REGULAR service was opened on a new 5-mile extension by the Chicago Rapid Transit Company on March 28, following inaugural ceremonies at the terminal. Three special trains of company, city and village officials and business men's organizations were operated over the line previous to the opening. Airplanes, aerial bombs and other innovations thrilled the crowd of more than 2,000 persons.

Among those who talked at the opening were R. F. Clinch, vice-president of the Rapid Transit Company, who represented Samuel Insull, chairman, and Britton I. Budd, president; B. J. Fallon, vice-president in charge of operation, and C. E. Thompson, assistant to the president Chicago, North Shore & Milwaukee Railroad.

L. E. Myers, head of the construction company which built the new line; United States Representative Carl R. Chindblom, Congressman Tenth District, Illinois, and Mayors Harry Pearsons and John Brown of Evanston and Niles Center, respectively, the towns served, were also among the speakers of the occasion.

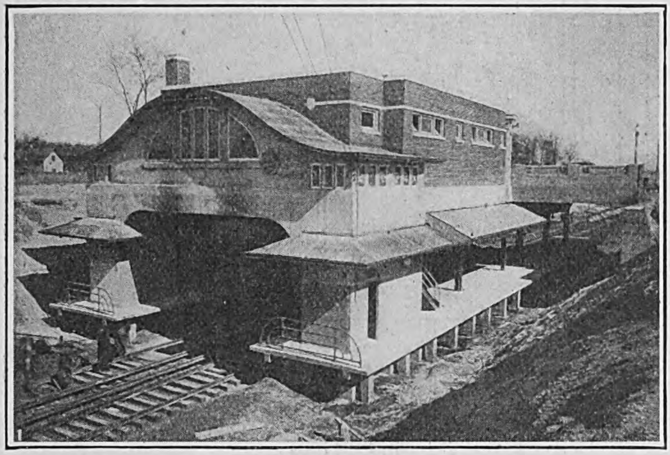
The first trial train was operated from the intersection with the present line at Howard Street to the Dempster Street terminal in Niles Center on Feb. 1. As outlined in the July 26, 1924, issue of ELECTRIC RAILWAY JOURNAL, this is the initial step in the construction of a new high-speed cutoff through the Skokie Valley to Waukegan. The article referred to included a map of the new line.

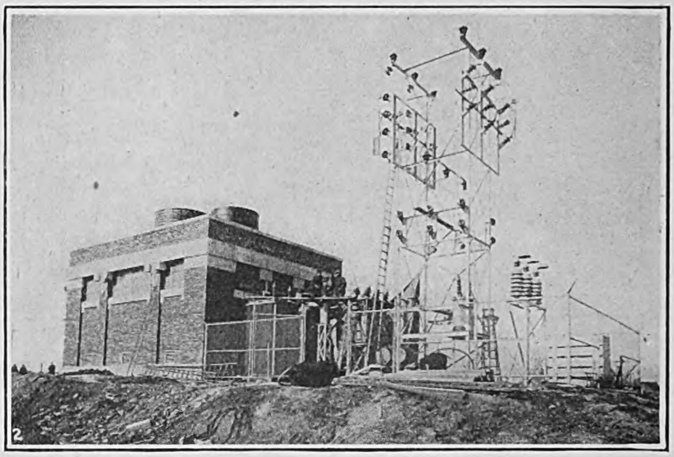
Construction designed for passenger service at high speed is a feature of the new line. It consists of a combination of open cut, permanent earth fill, open bridge work and surface construction. Stations are located on each of these sections. All of them are of

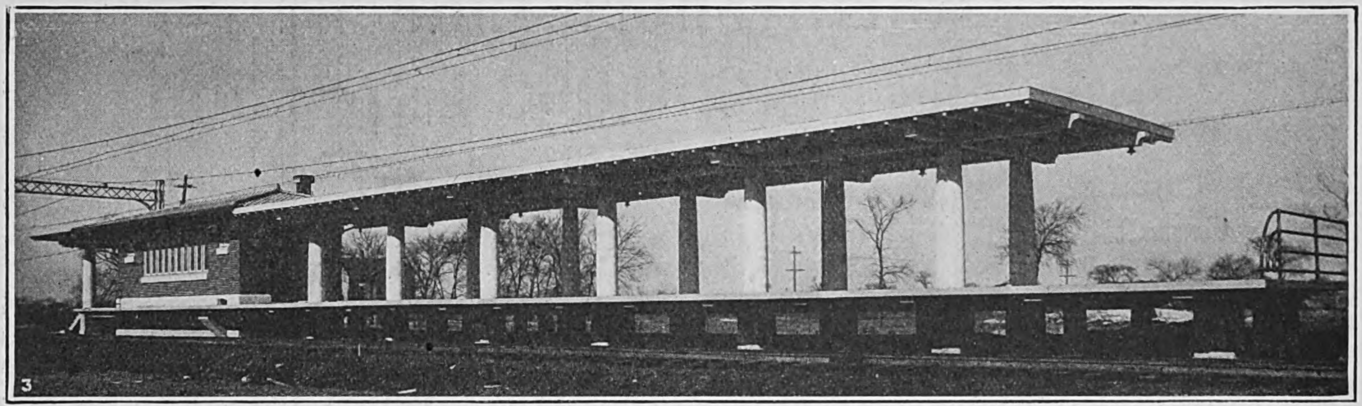


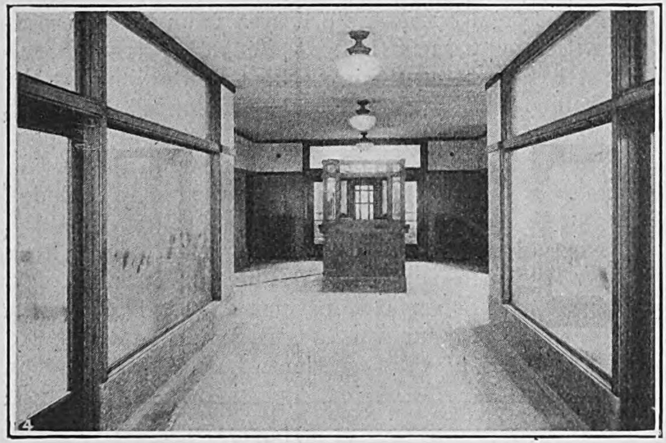
Heavy Overhead Catenary Construction Is Carried on Steel Towers Built Up of Bates Expanded Steel Poles. Where Clearances Permit, These Towers Are of Simple Overhead Bridge Type. At Other Locations the Supporting Columns Are Between the Tracks

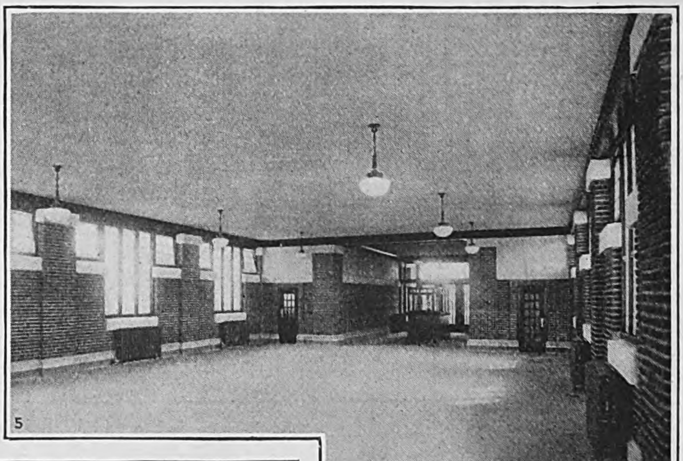
Attractive Architecture Marks the New Buildings on the North Shore Extension

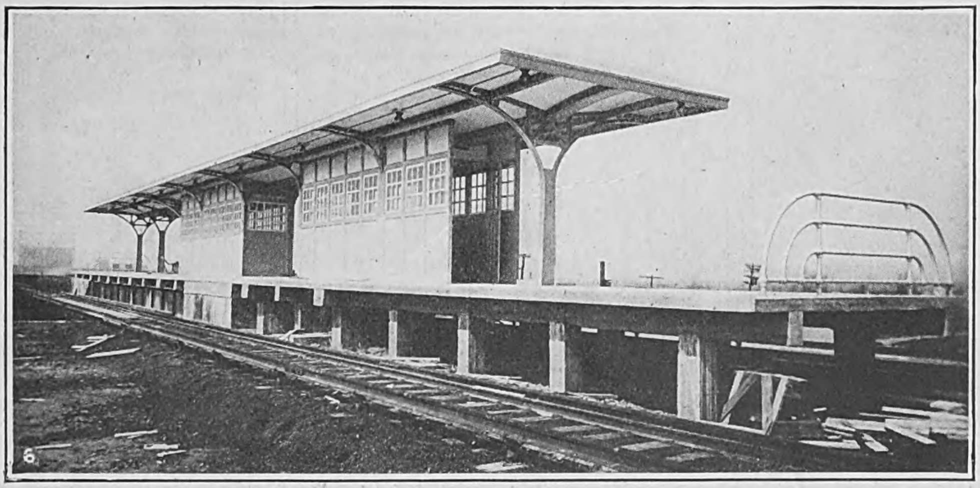

1


2


3


4


5


6

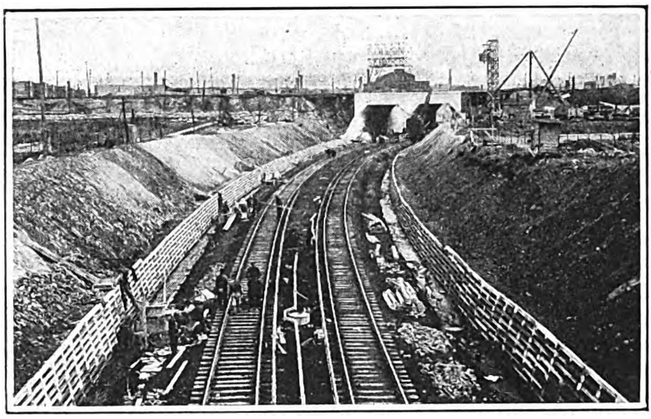
1. At Asbury Avenue, where the track is below the surface level, the station building is at street grade, with loading platforms below.
2. Power is supplied to the new line by a 2,000-kw. Westinghouse automatic substation, located 4½ miles from the Howard Street Junction.
3. The station at Schreiber Road illustrates the typical construction employed where tracks are on the surface level.
4. An interior view of the Ridge Avenue station.
5. Room is provided at the Dempster Street station for various concessions for the accommodation of passengers.
6. At Dodge Avenue the tracks are elevated. The station building is below the loading platform shown.

permanent decorative brick construction, ingeniously adapted to the individual grade conditions, and of a type of architecture in keeping with the general high-grade character of the entire development and with the reputation which the North Shore Line has established in the communities which it serves.

Some of the engineering and drainage problems which were involved in laying out the route were described in detail in the previous article. The method in which some of these conditions were treated is shown in various accompanying illustrations.

At Asbury Avenue and Ridge Avenue in Evanston the track is in open cut construction, passing under decorative concrete bridges at these streets. Similar stations at these two locations are arranged so that the buildings are on a level with the street, and straddle the two initial tracks below. Inclosed stairways lead to the loading platforms on the track level. Canopies extending from the building cover these platforms. It will be noted that the bridge abutments have been spaced wide enough to allow clearance for an additional track on the outside of each of the loading platforms, so as to make a four-track railroad when the new line is entirely completed. An interior view of the Ridge Avenue station shows the high-grade character of these buildings and the spacious accommodations provided for entering passengers. Another interior view shows the Dempster Street station, which for the time being will be the terminal of the line. Various concessions, including restaurant, news-stand, etc., will be located in this station.

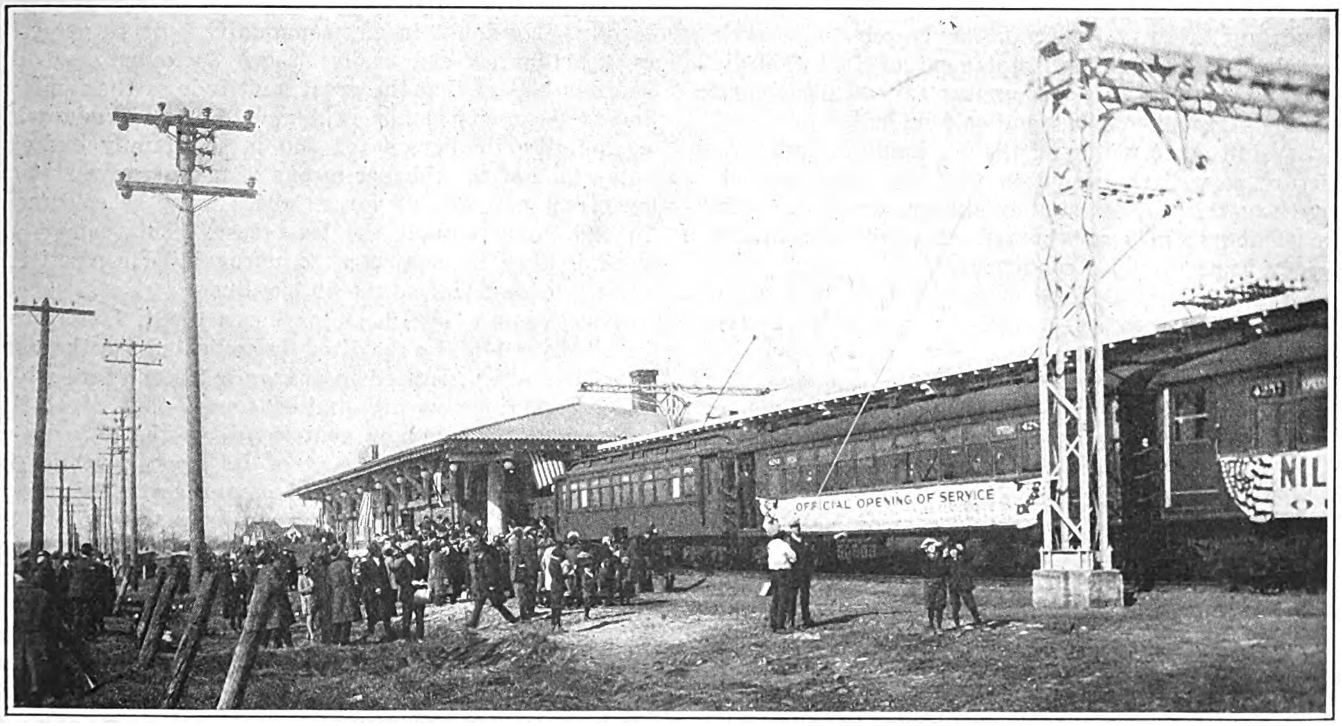
A typical station where tracks are on the surface is illustrated at Schreiber Road. The building is of pressed brick with tile roof, and the platform canopy is supported on large diameter pillars, giving a pergola effect. The elevated loading platform at Dodge Avenue, where the tracks are elevated above the cross street, is shown in another illustration. Here the station building is below the right-of-way pictured.



A Typical View of the Open Cut Construction of the New Line

Across the North Shore drainage channel and the Mayfair cutoff of the Chicago & Northwestern Railroad the tracks reach an elevation of 38 ft. above the natural ground level. This elevation was adopted in order to get legal clearances over the steam railroad, which also is elevated at this point. The conditions presented by this joint crossing of railroad and canal were further complicated by the necessity for providing spans for two future streets to be opened in this vicinity and for the new McCormick highway under construction by the Sanitary District. This combination of conditions led to the construction of approximately 1,000 ft. of continuous heavy steel bridgework. An accompanying illustration shows the appearance of this structure.

The electrical distribution system is of a new heavy type catenary construction designed to handle long trains at high speed. The primary messenger is made up of a composite strand consisting of a "copper weld" core and an outer layer of pure copper. Its diameter is 1.02 in., and it has a copper equivalent of 580,000 circ.mil. A copper feeder messenger below, which has



One of the Special Trains Run March 28 at the Inaugural of the Niles Center Extension of the North Shore Line. The Station Is Dempster Street, the New Terminal

a cross-section of 500,000 cir.mil, in turn supports the No. 0000 high-strength bronze trolley wire.

The overhead system is carried on fabricated towers built up with Bates expanded steel poles. These towers are spaced on 250-ft. and 300-ft. centers. All members are galvanized by the hot dip process. An article describing this overhead construction in detail will be published in a subsequent issue.

One Westinghouse automatic substation, with a single 2,000-kw. synchronous converter, is located 4½ miles from the Howard Street junction with the present main line. The Howard Street end of the line is fed from the present Calvary station of the Commonwealth Edison Company.

In order to comply with promises made to the officials of Evanston and Niles Center to have the line ready for operation on Feb. 1, it was necessary to carry on most of the heavy construction work under extreme winter weather conditions. Even with this handicap, the first train was operated on the date specified in the original agreement. For the time being the new line will be operated by the Chicago Rapid Transit Company under a lease arrangement, so as to give local transportation service to the new communities that are expected to develop rapidly along the new line.

The Readers' Forum

Comment on the St. Louis Street Railway-Motor Bus Situation

C. E. SMITH & COMPANY
Consulting Engineers

ST. LOUIS, MO., April 1, 1925.

To the Editor:

The analysis of the St. Louis street railway-motor bus situation by Mr. Buck and Mr. Stocks in the ELECTRIC RAILWAY JOURNAL for March 14 is such a complete, clear, unbiased statement of fact that little remains to be said; it was unnecessary to draw conclusions. They are obvious and self-evident.

In addition to picturing the St. Louis situation they picture as well the situation that may be expected in any large city under similar circumstances and conditions, and it may not be out of place to summarize briefly some of those conditions.

There is a very definite demand for motor bus service in addition to street railway service in districts adequately served by street railway lines as well as in intermediate and outlying districts not so served. This demand comes from those who have no automobiles and enjoy this opportunity to ride in an automobile at small cost; those who, particularly women, prefer not to drive their own automobiles through the congested districts and will not ride crowded street cars but will ride the buses; those who prefer to ride on a conveyance on which they will not be compelled to stand nor be embarrassed by other standees; those to whom the bus line may be a little closer and more convenient; and a small element of the riding public who have developed such animosity toward street car service that they welcome the opportunity to patronize a competitor.

It has long been my opinion that these various classes and any others who desire to pay more for a different class of transportation service, whether better or not, should be provided with that transportation to the extent to which it can be provided at the price they desire to pay for it, but that it should be established as a co-ordinated branch of the street railway service and not in competition with it. If co-ordinated it will be possible to work out a balance of service and an equitable transfer arrangement between the buses and the street cars, so that people may be transported for a single fare between points served by buses and points served by street railways, which is not possible when operated in competition without transfer privileges between separate companies.

On the other hand, it is surprising what a large element of the population, even including men of large affairs and big business, believe that competition in city transportation is beneficial and tends to reduce costs. Of course, it is axiomatic that to the extent to which competition brings about unnecessary duplication of service the costs will be increased, and the inevitable result will be an increased street car fare.

In every city there are certain street car lines that carry the cream of the traffic and are profitable. There are other lines that are unprofitable, but they are necessary in the whole transportation picture and must be operated, the loss being made up by the profits on the heavy traffic lines that carry the cream of the traffic. Motor buses cannot profitably serve those districts served by street cars that are operated at a loss. Motor buses can be operated profitably only in those districts where street cars carry the heavy traffic. When buses are operated as a parasite on the street railway system, reducing the profits on the profitable lines, the ability of the latter to carry the unprofitable street car lines is reduced to such an extent that fares must be increased over the entire street railway system.

There is a sociological question involved in the difference between a 7-cent fare and a 10-cent fare. The difference between these two rates means an average increase for transportation of about $50 per year per family. No doubt in any community 5 or 10 per cent of the families can easily absorb such increase, but I firmly believe that the great multitude of the families in any large city cannot contemplate or undertake with equanimity an increase of $50 in the family budget; to avoid that the cheaper means of mass transportation by street cars in the larger cities must be continued in full vigor and at the least cost. This cannot be done if they be subjected to unregulated competition of favored, subsidized motor bus lines.

The extent to which motor buses in St. Louis have been favored and subsidized is indicated by the fact that they are permitted to charge a 10-cent fare while the street railways are limited to a 7-cent fare; the street railway company contributes to the city somewhat more than 10 per cent of its gross revenues in various forms of taxation and paving costs, the motor bus company approximately 4 per cent; the motor bus company is not compelled to provide any particular quantity of service during the rush hours, but is permitted to choose the number of passengers for which it is willing to provide seats; the street railway is compelled to provide a fixed number of seats and a fixed area of standing room for all the passengers and carries the burden; the motor buses wear out pavements provided by others; the street car company pays for pavements used by others.

Contrary to the general understanding, motor buses in St. Louis do not provide faster transportation; two or three minutes saved per trip is offset by longer delays waiting for buses with an average loss by bus of five minutes per trip. They are noisy, smell oily, ride so roughly that newspapers may not be read, are irregular in operation, add to the congestion and delay all other traffic in the congested districts.

St. Louis was considerably overbuilt with street car lines in former years, and except to a very slight extent here and there no extensions were necessary. An increase in the company's investment of approximately 2 per cent for extensions would have satisfied that demand at any time and the company is properly subjected to very severe criticism for failing to provide and perform on such extensions the transportation service for which it had accepted a franchise. Under such conditions it is inevitable that competitive agencies of transportation may be expected not only to serve such unserved territories, but also to serve areas already served.

Although the first St. Louis bus lines served districts that have the best street railway service in the city, later service to outlying areas not previously served gave the bus company its firmest support for competition in St. Louis. Under the guise of serving small areas not previously served, rights were secured for most of the motor bus lines, 90 per cent of which operate either on streets having street car tracks or closely adjacent thereto. The original motor bus lines paralleling the heaviest street railway lines were profitable, but the later lines 7 to 8 miles long have changed the picture somewhat, as they are not as profitable as the original lines. There is very little short riding and apparently but little induced riding. Off-peak travel is light on all bus lines; during rush hours all seats are taken, but a seat is not provided for every one who would be a passenger.

The bus company cannot afford to provide enough equipment to carry all the business that would present itself during the short sharp peak morning and evening, and have the equipment and employees idle during the remainder of the day, but goes through the rush hours with only slightly increased service, while the street railway company must furnish seats and standing room for all. Thus, with the street railway as a stand-by to provide the costly service that has a low load factor, the buses have an opportunity of providing just enough service to get the highest load factor.

At one point in the city beyond the end of a street car line competitive motor buses are operated on the same street in the interest of the street railway company and also by its competitor. The competition bus service offers direct rides in and out of the business district and a certain measure of city-wide transfer service over bus lines. The street car company's buses exchange transfers with the street car lines (10 cents combined ride). On this street a clear picture is available of the preference of the people for the buses unified with the street railway system, since five times as many ride the street railway company's buses as the competitive buses.

It is futile to comment on means by which special privileges were secured from city officials by the motor bus company here. Suffice it to say that the officials who granted the rights justified their actions with strong support from those who desired the competitive service. Apparently that does not exceed 5 per cent of the riding public, but when operated as in St. Louis and other large cities even to that extent there must inevitably be decreased street car service or reduced wages or increased car fares to the 95 per cent who ride the street cars, or possibly a combination of those evils, and possibly ultimate purchase of the motor bus lines by the street railway company when the people demand co-ordination of service, as they have always done in the past where there have been separate competing unco-ordinated transportation agencies.

To avoid the repetition of past evils it behooves the people to see that motor bus companies, established as the one in St. Louis has been, do not secure special privileges in the way of high fares, low taxes, relief from regulation, pre-emptive rights or other special privileges to such an extent as to give them a considerable nuisance value at time of consolidation. In the long run it is not the street railway company that gets hurt but the car rider and the merchant.

C. E. SMITH,
Consulting Engineer Department of Public Utilities,
City of St. Louis.

American Association News

Way Matters

CONSIDERABLE progress in the investigation of the various subjects assigned to sub-committees was shown in the reports presented at a meeting of the committee on way matters held at association headquarters in New York on April 1 and 2. In the matter of the review of existing standards the sub-committee suggested certain changes in the standard rail specifications and the specifications covering the manufacture of special trackwork. Efforts are being made to bring these specifications into harmony with the views of a committee of the American Railway Association. Suggested changes in the special trackwork specifications were referred back to the sub-committee with instructions to consult the manufacturers and report at the next meeting. A lively discussion took place regarding the permissible tolerances in punched tie rod holes. Nothing has yet been done concerning additions or corrections to the drawings in the manual.

To secure the opinion of the whole committee, the sub-committee on standardization of frogs and switches presented two designs of lug fastenings for switch tongues and described the merits and demerits of each type. A poll of the railway members indicated that opinion favored the same design which had been favored by the sub-committee.

A comprehensive report regarding the status of tests and research work in connection with welded rail joints was made by W. W. Wysor. He stated that the third progress report of this committee would soon be ready for distribution. Arrangements are now being made to publish this report and distribute it to the railway industry. An offer received from the General Electric Company to proceed at its own expense with the "educated tie" tests of rail joints in various stages of defectiveness was discussed. The committee considered this a good method of collecting data on the subject of rail joints and expressed the hope that the company would continue with the test.

Results obtained with the *in situ* process of surface hardening rails in Toronto were described by A. T. Spencer. His report was accompanied by photographs showing the appearance of rails after several years of service. Additional data on this subject are expected to be obtained in the near future from the Boston Elevated Railway and the United Railways & Electric Company of Baltimore.

More co-operation from the railway members was asked in connection with the investigation of welding rod specifications. A questionnaire has been prepared and will soon be sent out to member companies. To enable the railways to use the information contained in the final report of the committee on way matters, it will be necessary to include practical data useful in directing and educating welders. It is hoped to secure this information from a number of railways before the report of the committee goes to press.

Slow progress is being made by the sub-committee on design of substitute ties. Questionnaires prepared at a meeting of the way committee in Cleveland on Jan. 22 were sent out on March 16, and 25 replies had been received prior to the New York meeting. Efforts will be made to follow up this matter and secure information from those companies which have not yet answered.

Responsibility for noise in car operation was thought by the sub-committee in charge of investigating this subject to be divided between the car and the track structure. Reduction of noise is 90 per cent a matter of maintenance and only about 10 per cent dependent upon the type of track construction, the committee believes. The committee suggested that this matter be taken up with the Bureau of Standards at Washington with a view to securing its assistance and possibly the use of instruments for measuring the volume of noise.

The sub-committee on design of limit of wear gage, wheel mounting, etc., reported that a meeting had been held on Jan. 29 in conjunction with a similar sub-committee of the equipment committee. This resulted in the making of several suggestions which are now being considered by the latter. The way committee requested its chairman to take up this matter and see if definite action could not be secured from the equipment committee. It was decided to recommend that in addition to the gage requirements definite maximum and minimum measurements back to back of wheels taken at the level of the wheel tread, should be specified and that wheels be removed from service when they do not conform to these requirements.

Reports were submitted by sub-committees on design of steam railroad crossings and of plain girder rails. Tentative designs were submitted covering three weights of 7-in. rail as prepared by the sectional committee of the A.E.S.C. and also some alternative designs suggested by E. M. T. Ryder. An expression of opinion was asked from the railway members, particularly with reference to the depth of head and retaining a fishing section in conformity with former association standards. The committee discussed the matter and it was agreed that the fishing section should be sacrificed if necessary in order to secure greater depth of rail head. It was thought undesirable to retain the present fishing section by increasing the depth of the rail section in order to give greater depth to the rail head.

A lively discussion occurred as to whether the next meeting of the committee should be held at French Lick Springs, Ind., or at Montreal. It was finally decided that the chairman should arrange for a letter ballot in order to give the absent members opportunity to express their views on this matter. Those present at the meeting were: E. M. T. Ryder, C. F. Gailor, V. Angerer, T. A. Ferneding, S. C. Baker, H. E. Bean, H. H. Dartt, E. B. Entwisle, R. B. Fisher, D. J. Graham, H. C. Heaton, N. M. Hench, M. M. Johnston, T. J. Lavan, E. L. Lockman, H. F. Merker, L. A. Mitchell, O. C. Rehfuss, A. T. Spencer, J. B. Tinnon, W. W. Wysor, and H. H. George, chairman.

COMING MEETINGS
OF
Electric Railway and Allied Associations

***April 16*—Wisconsin Utilities Association, Hotel Pfister, Milwaukee, Wis.**

***April 20-25*—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.**

***May 5-8*—Southwestern Public Service Association, Rice Hotel, Houston, Tex.**

***May 12-13*—Public Utility Section, Associated Advertising Clubs of the World, Houston, Texas.**

***May 25-28*—National Association of Purchasing Agents, Milwaukee, Wis.**

***May 26-27*—Regional Motor Transport Conference, Chicago, Ill.**

***June 2-4*—Central Electric Railway Association, French Lick Springs, Ind.**

***June 3-4*—Iowa Electric Railway Association, Waterloo, Iowa.**

***June 10-12*—Canadian Electric Railway Association, Montreal, Quebec.**

***June 26-27*—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

***July 22-25*—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

***Oct. 5-9*—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

News of Other Associations

Wisconsin Convention April 16

THE program for the annual convention of the Wisconsin Utilities Association to be held on April 16 at the Hotel Pfister, Milwaukee, has been announced by Secretary John N. Cadby.

In addition to the annual address by President G. C. Neff, and reports from various standing committees, the program will include the following subjects:

"Some Recent Legal Phases of Regulation," by Lewis E. Gettle, chairman Wisconsin Railroad Commission.

"By Our Achievements We Must Justify Public Confidence," by Marshall E. Sampsell, Wisconsin Power & Light Company.

"Some Recent Developments of Public Utility Financing," by George E. Frazer of Frazer and Torbet, Chicago.

B. W. Arnold, manager motor coach division Chicago, North Shore & Milwaukee Railroad, is chairman of the entertainment committee. At the banquet to be held in the evening a musical program has been arranged to enliven the occasion. Harry F. Atwood, president of the Constitution Anniversary Association, Chicago, will deliver an address on the federal constitution.

Entertainment has also been provided for the women in attendance during the convention. This program has been in charge of Mrs. G. Post of Milwaukee, and will include a luncheon in the Fern Room of the Pfister Hotel and a bridge party during the afternoon.

Pipe Flanges and Fittings

THE sectional committee of the American Engineering Standards Committee dealing with the standardization of pipe flanges and fittings has approved a number of important standards applying to malleable-iron and cast-iron screw fittings. These will now be submitted for approval to the sponsor organizations, which are the American Society of Mechanical Engineers, the Manufacturers Standardization Society of the Valve and Fitting Industry and the Heating and Piping Contractors National Association.

Transportation Studies at Technical Schools

TRANSPORTATION at technical schools will be discussed in an address by Prof. Winthrop M. Daniels of Yale University, at a meeting of the New York Railroad Club to be held on April 17. The full title of the address to be presented is as follows: "What Branches of Transportation Should Technical Schools and Universities Attempt to Teach?"

Chicago Motor Transport Conference

"CO-ORDINATED Transportation" will be the theme of a regional motor transport conference to be held under arrangements made by the National Automobile Chamber of Commerce at Chicago on Tuesday and Wednesday, May 26 and 27.

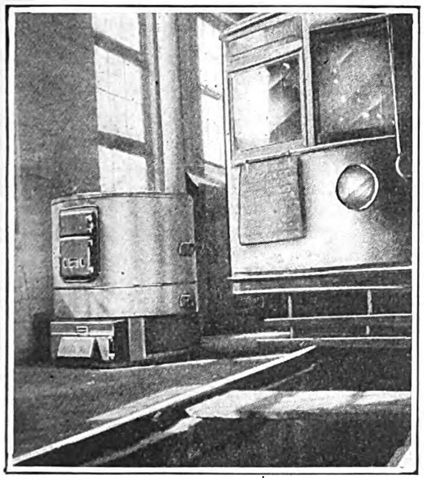
Among the speakers will be leading automobile, railroad, trolley and shipping executives from Chicago and the Middle West. The program will be similar to that of the New England Motor Transport Conference held at Boston on Dec. 8-9, 1924.

Besides discussion of the place of the motor truck and motor bus in short-haul transportation, there will be statements from varying points of view upon the wisdom of federal regulation of common carrier vehicles, a subject which has become of unusual importance since recent decisions of the U. S. Supreme Court indicating that such motor vehicles are not subject to state regulation.

Maintenance of Equipment

Pipeless Furnace Keeps Car Shops Warm

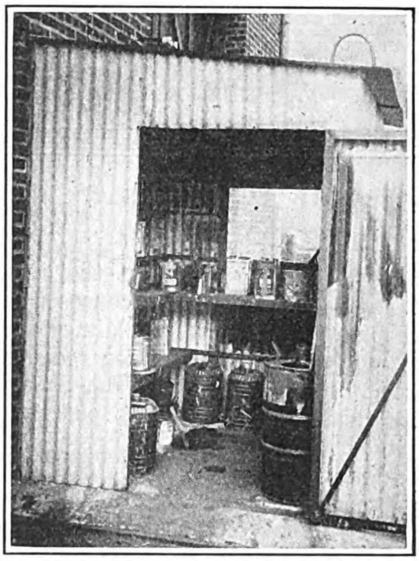
ONE of the problems which faced the management when operation was resumed on the New Haven & Shore Line Railway in 1923 was that of heating the car repair shops at Guilford. In the days of the predecessor company which operated this line until 1919, the repair shops were at Saybrook and the barn at Guilford was used only for storage purposes. On account of its location midway between the two ends of the line the Guilford structure was preferred by the new management as the location for doing maintenance and repair work. The heating problem was successfully solved by the installation of a Kelsey pipeless furnace, as shown in the accompanying illustration. This was done at a much lower cost than would have been required to install a steam-heating plant in this concrete building and has proved entirely satisfactory during the most severe winter weather.



A Pipeless Furnace Was Installed at Small Expense When This Carhouse Was Converted into a Repair Shop

Open Paint Storage Outside Shop

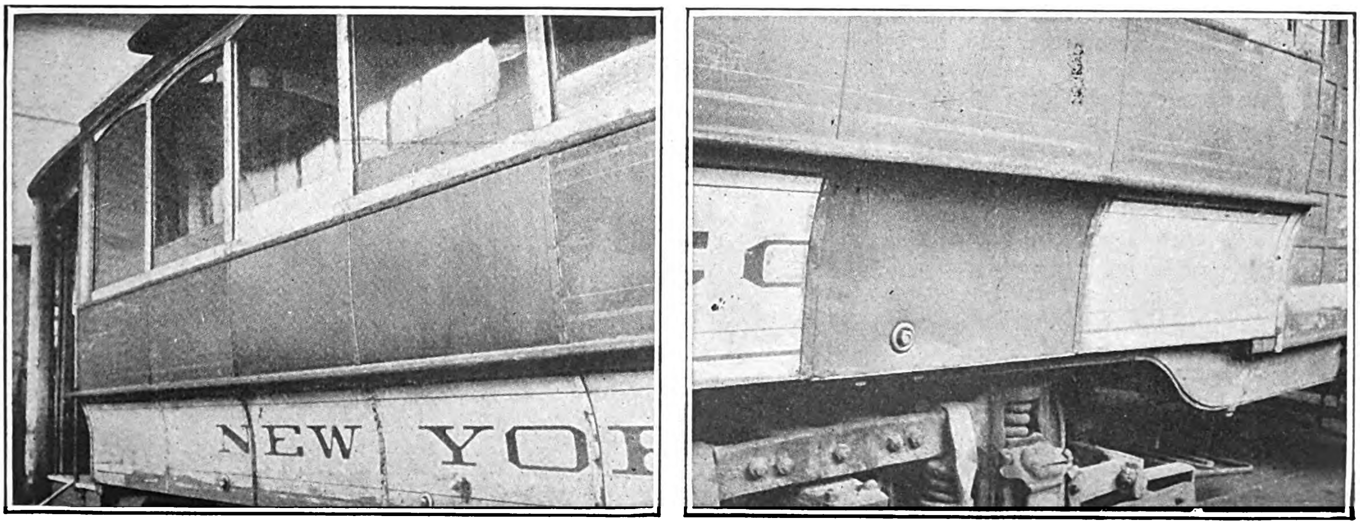
THE problem of providing a convenient fireproof storage for paints after the containers have been opened and they are in use has been solved in an effective manner at the 155th Street shop of the Eighth Avenue Railroad, New York City. A corrugated iron building 6 ft. x 6 ft. x 8 ft. high, with concrete floor, has been constructed just outside the paint shop and adjacent to the doorway. This building is provided with shelves for the storage of open paint and also has a bench around two sides for convenience in mixing paints. A window is provided in one side opposite the doorway so that during inclement weather the door may be kept closed and the interior still be efficiently lighted. During cold weather the building is heated by two electric heaters provided with Railway Utility Company's thermostatic control. This arrangement provides paint storage just as convenient as though it were inside the paint shop and at the same time removes the paints and oils from close proximity to cars.



Corrugated Iron Building Used for Open Paint Sotrage at the Eighth Avenue Railroad Shop

Repairing Car Panels with Sheet Steel

REPAIRS to car panels which have been damaged in accidents are made in the 155th Street shops of the New York & Harlem Railroad through the use of sheet steel. This method has been found much cheaper and consumes much less time in making repairs than the use of wood panels. No. 16 gage steel is used, which can be bent to shape readily.



Sheet Steel Is Used for Repairs to Upper and Lower Side Panels on the Eighth Avenue Railway's Cars

Where panels are split or otherwise damaged, the sheet is superimposed on the damaged parts.

In applying the sheets the Eighth Avenue Railway paints the material on the inside before it is applied. This gives the necessary protection against rust so as to minimize the danger of the panels deteriorating from rust starting on the inside. In painting the outside, the railway's standard method of painting is used. Very close inspection is required to detect the sheet steel paneling from the ordinary wooden structure previously used.

New Equipment Available

Narrow Drum Concrete Mixer

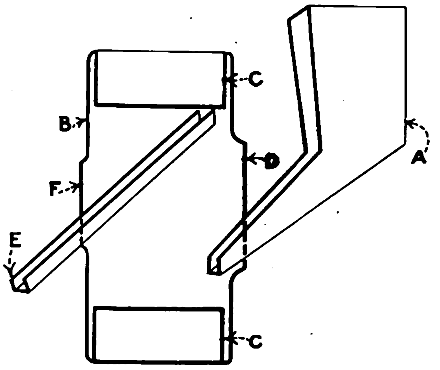
IMPORTANT saving in the time required for mixing concrete is the principal advantage claimed for a new, narrow drum mixer recently placed on the market by the Standard Scale & Supply Corporation, Pittsburgh, Pa. The charging hole has a diameter of 24 in. and the skip, when elevated, reaches such an angle that the charge drops almost vertically into the drum. The latter is deep enough to receive the entire charge in one shot, no part of the aggregate being held in the charging chute until the drum revolves.

To avoid the scattering of the load the walls of the drum were built close together, thus keeping the aggregate within the confines of a narrow space. When the drum is set in motion the buckets lift the aggregate up and with a scouring motion tumble it down again and again into one conglomerate mass. The aggregate need not be pushed from one side of the drum to the other, and it is claimed the mixture is completed in fewer revolutions of the drum than would otherwise be possible.

An 18-in. diameter discharge opening permits a wide discharge chute, the latter being just wide enough to have free movement in this opening. Because of the large opening and the narrow drum the chute can be tipped to a sharp angle, while the chute reaches near to the other side of the drum. As shown in the illustration, the far end of the chute is directly under the far end of the buckets. These drop the aggregate directly into the chute, with considerable momentum. Because of its momentum it is said that the concrete does not adhere to the chute.

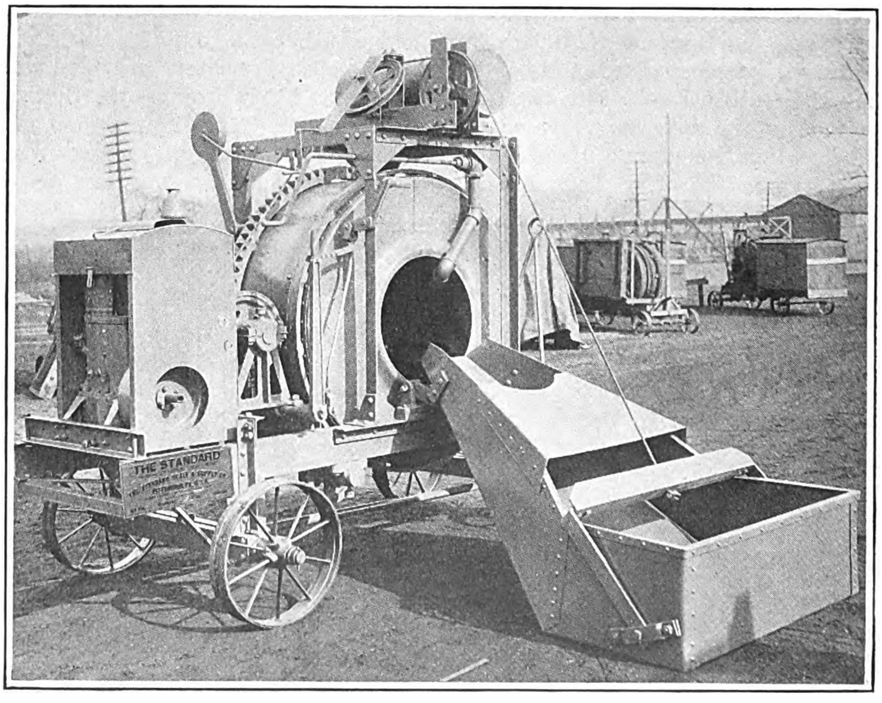
This mixer is so built that the operator, without moving from his position, manipulates the power-loader lever, the discharge lever, and turns on the water for the mix. Through the 24-in. charging hole he can see into the drum and determine whether he has enough of each kind of material.

The mixer is very compact and can be easily transported from place to place. The front wheels pass under the frame, making short turns possible. Another feature is the interchangeability of the low charger and skip loader. If the user wishes to change from one to the other he can obtain a skip which is installed on the job, as holes have been drilled in the frame for attaching this equipment.



When Raised, the Skip Drops the Charge Almost Vertically into the Narrow Drum

A—Skip loader. *B*—Drum. *C*—Buckets. *D*—Charging hole. *E*—Discharge chute. *F*—Discharging hole.



Without Moving from His Place the Operator of This Concrete Mixer Controls Loading and Discharging. The Wide Opening Allows Him to Examine this Condition of the Mixture

Disconnecting Switches

IN A NEW line of disconnecting switches known as Type LG-17, now being marketed by the General Electric Company, Schenectady, N. Y., the cantilever strength of the insulator unit has been greatly increased by a double crimped cap and the addition of a pin cast integral with the lower fitting. Both hinge and contact clips are cast integral with their blocks; the blade of the switch, being in two sections, possesses much more lateral rigidity than would be the case if the blade were of a single piece, and the use of bolts through the two sections of the blade, above and below the clip, provides a convenient means of adjustment or readjustment of contact pressure.

All forms of the switch are furnished with a new type of latch or safety catch. On double-throw switches there is a latch at each end. The action of the latch is positive and combines both latching and opening features. A new switch hook is also included in the development, incorporating both a special "V" hook for the LG-17 and a standard hook for operating other forms of disconnecting switches and latches.

The News of the Industry

Cleveland "Closed Shop" Void, Says Court of Appeals

On the grounds of public policy, the Court of Appeals, sitting in Cleveland, Ohio, has just decided unanimously that the closed shop agreement between the Cleveland Railway employees and the union is null and void. If the decision is not carried to the State Supreme Court, or is upheld by the State Supreme Court if carried there by the union, it means that further contracts between the Cleveland Railway and the union will not carry any "closed shop" agreement.

By a vote of two to one, the Court of Appeals also decided that the Cleveland Railway had a perfect right to withdraw, as it did, from the arbitration proceedings of last June. In these arbitration proceedings two of the arbiters granted the platform men of the Cleveland Railway an increase in pay of 12 cents an hour. The Court of Appeals upheld the lower courts in deciding that the sitting of James W. Holcomb as the third arbitrator in the case constituted "a legal fraud." The court ruled that Mr. Holcomb had disqualified himself as an arbiter in the case by his conduct and by the fact that the union had indorsed him for a federal position. In the lower courts the "closed shop" agreement between the company and union was held to be valid.

William S. Fitzgerald, one of the international vice-presidents of the Amalgamated, has gone to Cleveland to try to help the car men's local and determine what the union's next step shall be. A mass meeting of the men was scheduled for April 8, to determine what the union should do, by reason of the adverse court decisions, and also by reason of the fact that May 1 is the time for seeking a new wage agreement.

Central New York Railways After Bus Franchises

The establishment of an extensive network of bus lines in Central New York is forecast by the announcement that a new concern, the Mid-State Coach Lines, Inc., has filed articles of incorporation in Onondaga County. This concern will be owned by the Rochester & Syracuse Railroad, the Empire State Railroad, the Auburn & Syracuse Electric Railroad and the Syracuse Northern Electric Railway, Inc. These lines already are seeking bus line privileges in Oswego and Auburn, and on a route which would connect Syracuse and Oswego.

The purpose of the company is to operate buses as feeders to existing railway lines, the companies retaining separate identities for carrying on their railway operations.

In the meantime the Auburn & Syracuse Railroad officials are seeking bus privileges in Auburn in competition with an unnamed client of Frank J. Cregg, Syracuse corporation counsel, for the privilege of running buses in that city.

Talmadge C. Cherry, vice-president of the Auburn & Syracuse Electric Railroad, and vice-president and general manager of the Rochester & Syracuse Railroad, recently addressed the Common Council of Oswego on behalf of the bus line application. His buses would run on a 7-cent fare. James W. Dillon, Syracuse, who is operating buses successfully on a 5-cent fare in the neighboring city of Fulton, has offered to run the Oswego buses on a 5-cent fare.

The officials of the Mid-State Coach Lines, Inc., are: Directors, T. C. Cherry, Walter K. Zinsmeister and Harry C. Stanton, Syracuse, and Ray S. Messenger and William Harvie, Auburn. All are connected with the Auburn & Syracuse Electric Railroad.

Chicago and Milwaukee Grants Defeated

Elections Unfavorable to Proposed Settlements in Mid-West Cities—Third Vote in Chicago in Twelve Years—Milwaukee's Need Less Immediate than Chicago's

CHICAGO'S $500,000,000 transportation ordinance was beaten soundly in a referendum on April 7. It provided for co-ordination of surface and elevated lines and establishment of subways and bus lines under city management and eventual city ownership. The existing surface lines are now up against a franchise fight, the franchises expiring in 1927. The vote was a surprise. The final figures follow:

For adoption of ordinance	227,554
Against adoption	329,228
Majority opposed	101,674
For operation of lines	226,681
Against operation	327,543
Majority opposed	100,862

Analysis of the vote shows that while it could not be termed wholly intelligent, it was at least typical, and the record number of voters at a by-election can be taken to mean that Chicago is definitely against any municipal ventures in running transportation lines. It is the third defeat of a transportation referendum in twelve years. That the voters did not understand in some districts was shown by the fact that some persons voted against the establishment of the system but voted in favor of the city operating it.

Lined up against the measure and represented by the Hearst newspapers were scattered political organizations and the remnants of the old spoils gang which had a "5-cent fare" platform as its transportation policy. Hearst claimed a victory, but all the aldermanic candidates indorsed by him and by William Hale Thompson were beaten at the same time that the traction ordinance went down. They were all anti-ordinance. The separation of politics from the referendum was evident.

Mayor Dever said plans will go forward at once for a new ordinance drawn along different lines.

The campaign went into high gear four weeks before the election and like all other campaigns threatened to lose sight of the main issue. Mayor Dever, however, kept the proponents of the ordinance from hysteria. He proved to be an ideal campaigner, never making an unqualified statement he could not personally back up. This was one of the qualities that helped the pro side.

The personality and partisanship elements became important at the outset. William Randolph Hearst with two powerful newspapers, William Hale Thompson, a notorious demagogue who promised 5-cent fares while he was Mayor during the world post-war days and hired $100 a day "traction experts," and Governor Small, as well as many of their associates who were running mates of politicians tried lately on graft charges, were against the ordinance.

Roy D. Keehn, Hearst's personal representative, wrote to two internationally known bankers asking whether they would be under any obligation to purchase the Schwartz certificates, the medium of payment for the car lines. The bankers wrote that there was no obligation, but that the certificates would be readily salable if the lines were competently managed and they said they would recommend them to their investors.

This reply drew the headline "No Bank Cash for Car Lines," and the bankers indignantly demanded a retraction.

William Hale Thompson publicity sheets warned the public to "beat the biggest traction steal ever attempted." Said Mr. Thompson:

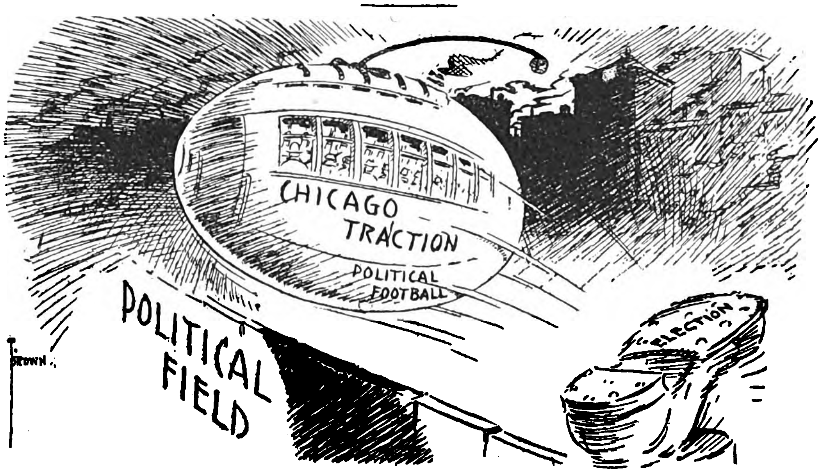
> This ordinance provides for an increase of car fares to not less than 15 cents. The new measure would relieve the traction monopoly from paying taxes and would saddle upon the taxpayers an outlay of $172,000,000.
>
> This ordinance would prohibit modern rapid transportation. It would bind the people of Chicago to the use of the present obsolete system. It would give control of Chicago's streets in perpetuity to the Morgan-Wall Street-Brennan financial pirates. . . . Lies. . . . sugar-coated promises . . . higher taxes . . . jammed through council . . . nefarious scheme to pick the pockets of the strap hangers . . . boodle.

Henry A. Blair, president of the Chicago Surface Lines, after a first word of caution against the ordinance because of his mistrust of municipal operation, meticulously avoided mention of it as did his associate, Leonard A. Busby, head of the south side surface lines, a strong advocate of the co-ordination. Samuel Insull was out of the city for a month and returned on the last day with a statement that he indorsed the ordinance because its co-ordination and expansion program was necessary and could be had in no other way.

The Chicago Surface Lines is rounding out 18 years of service under an ordinance of which Mayor Dever, as an alderman, was part author. The lines ran for several years under separate managements, but were co-ordinated, and since that time have made steady progress until they have been able to show a good financial sheet despite the fact that 55 per cent of net earnings have been paid annually to the city.

The elevated lines have been slower to respond, although there has been good management with good public relations work and advertising. The elevated has charged a cash fare of 10 cents, a ticket fare of three for 25 cents and a weekly pass for $1. The Surface Lines fare is 7 cents.

BACK IN THE OLD FIELD AGAIN.



Chicago "Daily News" Sees Traction Matter Again Football of Politics

Milwaukee Agreement Defeated

By a majority of more than two to one the people of Milwaukee, Wis., on April 7 overwhelmingly expressed their opposition to the adoption of the proposed service-at-cost contract between the city and the Milwaukee Electric Railway & Light Company. Under the terms of the contract the city would have received the right to participate in the management of the affairs of the company in the metropolitan area and would have had the opportunity to obtain the credit on surplus earnings which were to be used to reduce the purchase price of the properties should it have been decided to purchase them at some future date. The vote in every ward was against the contract.

Such prominent proponents of the contract as Mayor D. W. Hoan and Fred S. Hunt, chairman of the Public Utilities Acquisition Committee, which spent five years in investigating and negotiating the contract, declare that the people unwisely passed up an excellent opportunity to bring about local regulation of their utilities in favor of a continuance of the present alleged unsatisfactory regulation by the Wisconsin Railroad Commission. These men feel that the people were misled and did not have a clear understanding of the contract. Two of the three local newspapers were in favor of the plan, while the other opposed it. All local civic organizations passed resolutions favoring the contract with the exception of the Engineers Society of Milwaukee.

Although the plan was defeated it is expected that out of it much good will come to the city in the way of facts and data which were brought out in the preparation of the contract. The city now has a better conception of the company's operating and financial affairs. Possession of these facts, it is maintained, will be of great value to the city in preparing its side of future service and rate cases.

In spite of the overwhelming defeat of the service-at-cost contract a new movement is on foot by city administration champions of the contract which is designed to accomplish their aims in a more sweeping manner. The new move is in the form of an out and out public ownership bill introduced in the Legislature by Assemblyman Thomas M. Duncan, Milwaukee Socialist leader and secretary to Mayor Hoan. Under this municipal ownership bill, power would be given to the city of Milwaukee or any other city in the state to take over its public utilities through the creation of so-called public service districts. Through the establishment of these districts in Milwaukee the present law limiting the city to an indebtedness not exceeding 5 per cent of its assessed property valuation would be evaded. This so-called district, by making its geographical lines vary slightly from Milwaukee's present city limits, could again bond itself up to 5 per cent of the assessed valuation of the area, thus paving the way for the public ownership, operation or control of the public utilities properties supplying service in such districts. Under the plan the municipal ownership question would be submitted to the voters.

Voters of Rockford, Ill., on April 7 defeated a proposition to grant a railway franchise to the Rockford Public Service Company, a newly formed corporation, indorsed by Mayor J. Herman Hallstrom. The traction situation is in a muddle as the result of the refusal of a franchise to the present company, the Rockford City Traction company. The latter company has been operating two years without a franchise. It is expected that the question of granting a franchise to the Rockford City Traction company will be submitted to a special election later in the year.

Springfield Union Rejects Proposal for Mayors to Arbitrate

Employees of the Springfield Street Railway, Springfield, Mass., recently asked for an increase of approximately $1 a day for regular men and rejected a proposal laid before them by President Clark V. Wood that questions in dispute be submitted to an arbitration board of five to include the Mayors of the city of Springfield and Worcester. The men said they had "no desire to place the transportation question in politics." President Wood said the company could not possibly continue to pay the wages now in effect and at the same time furnish the service to which the public was entitled.

The trolleymen want to establish an eight-hour workday to be completed inside of eleven hours. They want a maximum wage of $6.40 a day for a six-day week, assuring a maximum weekly wage of $38.40. The present wage of the trolleymen is $5.44 a day.

The cancellation of the contract, according to President Wood's proposal, makes it necessary to draft a new contract to become effective June 1. He suggests the appointment of an arbitration board, the company naming one arbitrator in five days from the date of the written agreement to arbitrate; the employees naming one within the same period. The Mayor of Springfield and the Mayor of Worcester will each be asked to act as an arbitrator, or to appoint some person as representative to act in his stead, and the two Mayors or their respective representatives will have the power to select the fifth member of the arbitration board to act as chairman. The decision of the majority of the board will bind both management and employees for a term of years beginning June 1, 1925, and not exceeding three years as the board may fix.

Railway Wants Bus Rights in New York City

Twenty-six applications for bus franchises were filed on April 9 with the franchise bureau of the Board of Estimate of New York City in accordance with the amended specifications suggested by the Board of Transportation. This is less than half the number of bids received under the first call for suggestions. The Interborough Rapid Transit Company, the Brooklyn-Manhattan Transit Corporation and the Third Avenue Railway, which had previously applied for franchises, failed to file new applications.

Of the existing transportation companies, other than those operating bus lines, only the New York Railways through a subsidiary filed a new application. This application offered to surrender the perpetual franchises for five surface lines and substitute bus operation, if franchises were granted for 25 years or for a lesser period sufficient to amortize out of bus earnings the investment in the electric railway property abandoned.

The Manhattan Surface Coach Company made two applications, signed by its president, H. J. Sheeran, receiver for the New York Railways. One application stated that the New York Railways was willing to surrender its perpetual franchises for the following surface lines and substitute bus operation:

Seventh Avenue-Delancy Street line, Sixth Avenue line, Columbus-Lenox Avenue line, Eighth Street crosstown line and the 116th Street crosstown line.

In its proposal known as application No. 1 the company estimated the investment required to provide equipment and facilities to render the service contemplated on the 12 routes outlined by the Board of Transportation to be in the neighborhood of $6,455,000, made up as follows:

Buses	$3,579,000
Garage and maintenance equipment	2,226,000
Organization and other intangibles	350,000
Supplies and working capital	300,000
Total	$6,455,000

Proposal No. 2 places the number of double and single deck buses at 432, involving an investment of $4,108,500 in buses. A front-drive type of vehicle is proposed to be used. On crosstown east and west lines a fare of 5 cents per passenger is proposed, but on the longitudinal or north and south lines the fare would be 10 cents cash, with tokens sold at the rate of twelve for $1.

Steam and Electric Roads After Bus Privilege

The Eastern Massachusetts Street Railway has taken up the gauntlet of the Boston & Maine Railroad in the fight over the bus line which the street railway is maintaining between Boston and Lowell, Mass. The issue was fought in a preliminary skirmish in Woburn, where the electric's bus rights were revoked. Later the issue may have to be decided in other communities.

The Boston & Maine says that it should be carrying 1,000 passengers a day for full fare between Lowell and Boston; that it depends upon its full-fare passengers to enable it to maintain frequent service and low commutation rates, so that if the Eastern Massachusetts is permitted to maintain its bus line to take away the full-fare passengers it will be necessary for the Boston & Maine to raise its fares and to curtail its service. It declares further that when the Eastern Massachusetts takes away one $1 passenger the Boston & Maine loses $4, because it loses the passenger, but has to maintain the service.

The Eastern Massachusetts replies to this argument that it has prior rights in the field, because it asked for these licenses last summer. Having obtained its licenses from the several cities and towns it invested about $80,000 in buses and established a scheduled service which is carrying an average of 250 passengers a day between Boston and Lowell, and the income covers the cost of the service. In addition to this the Eastern Massachusetts has close to $5,000,000 invested in the Lowell district, and is obliged to protect this property. If it had not gone into the bus service some private concern would have entered the field.

Buses for Kansas City

Franchise Approved Under Which Railway Expects to Start Service Soon with 63 Vehicles—Attitude of Public Is Favorable

AUXILIARY bus service by the Kansas City Railways is apparently assured. On April 6 the City Council of Kansas City, Mo., passed the ordinance allowing the company a franchise for three years. The ordinance has been in the hands of the special bus committee and the City Council since Dec. 1, 1924.

The receivers for the railway originally asked for a twenty-year franchise. The city's bus committee considered this period much too long. The life of the franchise was finally agreed upon as three years and an ordinance stipulating such duration of the exclusive franchise was drafted and presented to the City Council for its approval. Buses seemed practically assured, but when the Council voted upon the measure the Democratic faction of the lower house formed a bloc by proposing an amendment to the effect that the franchise should terminate within six months after the end of the present receivership and refused to pass the ordinance as it stood originally. The amended bill was referred back to the committee, which, in turn, re-referred the bill to the lower house in its original state. It was returned to the committee the second time, and once more was returned to the House for passage or rejection.

During the week ended April 4 members of the Democratic bloc were credited with saying that they would compromise upon a two-year period, but the receivers for the railway expressed very grave doubt that Judge Kimbrough Stone, referee, would approve a grant so short in duration. The result was that when the bill was to go before the Council the last time the public had almost given up hope of having a bus system. However, leaders of the Democratic bloc surrendered and voted with the Republicans for the approval of the franchise bill in its original state.

The receivers of the railway are said to be well pleased with the final action on the ordinance and seem confident that there is to be no further delay in starting the system of buses. Under the provisions of the ordinance the receivers are allowed 60 days in which to accept the franchise. If Judge Stone approves, and the company is able to obtain delivery on its bus orders, the first buses are expected to be in operation 45 days thereafter. Judge Stone is said to have expressed the intention of approving any franchise permit which would be fair to the city and to the railway. The receivers are said to have definitely agreed to present the franchise to Judge Stone at once.

There are to be nine routes in the operation of the proposed service, and after the date at which the first line must be in operation (3½ months after April 6) two additional lines must be put in operation each month until the entire system of nine lines has been consummated. The receivers are said to have expressed their belief that some of the lines will have been established by July.

Mayor Beach signed the ordinance on April 7.

The main points of the franchise follow:

The railway must operate nine permanent routes, specified in the franchise.

The fare on all lines, excepting route No. 5, which is to have express service, will be 10 cents. Express route fare will be 25 cents.

Transfers from buses to street cars and from street cars to buses are to be issued for 3 cents additional on all cross-town or feeder lines.

Buses are to operate from 7 a.m. to 11:30 p.m.

Headways are not to exceed fifteen minutes in rush hours and not more than twenty minutes in non-rush hours, Sundays and holidays.

Capacity of each bus is to be a seated load.

License fee is to be $75 for each single-deck bus and $100 for each double-deck bus.

Smoking is to be prohibited on all buses except the double deckers, on which smoking will be allowed on the rear of the upper deck.

The railway is to assume liability in case of accidents.

Double-deck buses are to be operated on four routes and single-deck buses on all other routes.

Sixty-three buses are considered by the receivers to be necessary to the proper operation of the various routes. The receivers say that although they have not finally decided upon the make of bus to be used, they have decided upon the general type and will make their final decision and order the buses just as soon as Judge Stone has definitely approved the arrangements. The investment requisite for the inauguration of the service is estimated at about $750,000.

A garage with 25,000 or 30,000 sq.ft. will be required to house and service the 63 buses. The railway shops are said to be adequate for all rebuilding and heavier repairs. The old quarters of the defunct company which promoted the Priests of Pallas festival in Kansas City for many years have recently been under consideration as a prospective garage, but nothing definite has been decided.

Senator Wilson is credited with a statement that there will be no curtailment of the present street car service after the buses are going.

On favorable approval of the project from Judge Stone, bondholders and other creditor interests will have the right to enter an appeal, but in all the length of the present receivership there have been no appeals against any previous decisions of the referee and none is expected in this matter.

The general attitude of the public toward the projected bus service, so far as it is known, seems to be more than favorable.

Cleveland Bus Routes Approved

Nine bus routes to be operated by the Cleveland Railway, Cleveland, Ohio, starting about the middle of June, have been approved by the Cleveland City Council. Seven of the routes will be used as feeder lines to the street car system, while two more will be main lines of the Cleveland Railway. In approving the operation of buses by the Cleveland Railway over these routes, the Cleveland City Council ignored an application by the Metropolitan Motor Coach Company for permission to operate buses at a 5-cent fare. The Cleveland Railway is to charge 10 cents on its buses. The Metropolitan Company now has applied to the State Public Utilities Commission for a certificate of convenience and necessity for the operation of buses in Cleveland, but inasmuch as a law just passed by the State Legislature and signed by the Governor gives cities the control over buses operating within municipalities, it is unlikely that action will be taken.

New York State Employees File Demands—Company Counters

Demands for wage increases have been filed by employees of the city lines of the New York State Railways in Utica, Syracuse and Rochester, as well as by workers on five interurban lines, the Rochester & Syracuse, Empire State, Syracuse Northern and Auburn & Syracuse, who demand 70 cents an hour, and the Syracuse & Eastern, who ask a raise from 50 to 57 cents.

The railway asks its employees to accept a cut from 55 to 50 cents an hour for city line workers, with 5 cents an hour additional for one-man car operators. One of the proposed changes is a slash in overtime payment from 22 to 10 cents above the regular rate.

It has been understood that the traction company will ask for a clause in the contract which will permit separate negotiations with the unions in the three cities. At present agreements must be made by joint vote. A conference on the new pact is set for about April 15. In case settlement is not reached by May 1, the terms of any agreement that may be reached are retroactive to that date.

Among other measures the trolley men ask one day of rest in seven, an insurance fund providing $1,000 payment on death or total disability of workers and hospital cases, doctors' fees and full wages for those temporarily disabled for more than seven days. They also request that all men on buses operated by the company or its subsidiaries be union members. Time and a half for overtime, instead of the present 20 cents an hour extra, and a guarantee of six hours a day for all extra men in place of 42 hours per week are among the demands.

Tornado Damage Repaired Promptly

Tornado damage done to the property of the Southern Indiana Gas & Electric Company, as reported in the Electric Railway Journal of March 28, page 517, was substantially correct as to the estimate of its amount, but the report, based on an early survey, was misleading as to the estimate of the length of time the traction service might have to be suspended. This was put as a probable period of several weeks. Transportation service was maintained continuously from the morning of March 19, the day after the storm, by means of buses run through the damaged area. Normal electric train service was restored on March 22, the fourth day after the storm. As for the power and light service, it was restored the day after the storm.

Suggest Experts for Tacoma and Board of Five to Make Test

Statement of what the officials of the Tacoma Railway & Power Company, Tacoma, Wash., believe should be the basis of a plan for final settlement of the transportation problem of Tacoma and two suggestions for a test of operation under some plan that would involve joint city-company representation were contained in a document presented recently to the City Council by the company.

After reviewing the difficulties and declaring that the railway is vital to city transportation, the statement concludes that, to give the best transportation at the lowest cost, jitneys must be abolished, also gross earnings tax and free rides for city employees; that paving requirements must be modified, the company be allowed to extend service by car or bus, and fares be so adjusted as to give good service at a reasonable rate of fare.

The documents suggested that experts mutually agreed upon be employed by the city to investigate facts and recommend a plan for a try-out. Both company and city will be bound to test the plan. An alternative would be to create a board with control of both the traction lines and the municipal car line, the Tacoma Railway & Power Company to operate the system and receive at the end of a test year a return equivalent to the average net earnings for the last five years. Both company and Council would be bound to accept a final plan that the board would report back after its experiment.

No Agreement in Hudson

Efforts at a compromise having failed between the city of Hudson, N. Y., and the Eastern New York Utilities Corporation over car service in Hudson, additional evidence was heard by the Public Service Commission, on April 1, on the company's application for consent to abandon its local tracks.

A new statement of income and expenses was submitted by the company today purporting to show the deficits sustained by the company each year since 1917. The figures of deficits by years show: 1917, $9,095; 1918, $7,518; 1919, $6,610; 1920, $6,841; 1921, $9,895; 1922, $8,968 and 1924, $8,835. It was claimed that these figures were exclusive of any return on the capital invested in the line. The company also submitted statements showing the number of passengers carried by months for each year since 1916.

Summary of Recent Bus News

With the Public Service Commission about to grant to the Albany Transit Company, operating a fleet of buses, in Albany, N. Y., a raise in fare from 8 to 10 cents, and the United Traction Company, operating in Albany, Rensselaer, Watervliet, Troy, Cohoes and Waterford requesting a raise in fare from 7 to 10 cents, Mayor Hackett of Albany comes out with a statement that a New York City bus company has offered to come into Albany and give service at a 5-cent fare. On the other hand the Common Council of Albany has just given the United Traction Company permission to operate buses on its Western Avenue line, where there has been a controversy for several years regarding paving and double tracking. The Albany Transit Company is the successor to the W. I. A. T. Corporation, Inc., one of the pioneer bus lines up state. Mayor Hackett has twice carried Albany by overwhelming pluralities. As political wiseacres see it, if he is successful in his fight for a 5-cent fare, not only will he become prospective gubernatorial timber but his influence will be reflected in other upstate cities on the traction issues.

Just before adjournment the New York State Senate killed the Fearon bill, permitting electric railways to establish bus lines without incorporating as separate companies. The fight against it was led by Buffalo Senators who were supported by most of the Democrats. Senator Hickey of Buffalo called it a grab bill, declaring it would give the electric railways a monopoly on all local transit lines. Senator Fearon explained the cities were adequately protected, and the proposed bus lines could not operate without the consent of local authorities.

The St. Louis Bus Company, subsidiary of the United Railway, St. Louis, Mo., opened its third bus line on April 5. This route is known as the Morganford Road-Kingshighway Boulevard line. A report of the company's operations filed with the City Comptroller recently showed a total revenue of $4,466 for a period of a little less than three months from Nov. 9, 1924, to Jan. 31, 1925. The city was paid a 3 per cent gross receipt tax totaling $134 for this period. Since January the two existing bus lines of the company experienced a decided increase in business.

Public Service Commissioners recently heard the application of the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for a certificate of convenience to operate buses between Fox Chase and Richboro, Bucks County, a distance of 12 miles. A bus line is now operated between the points named by Charles Springer and an application is pending for the transfer of Springer's certificate to the Richboro-Fox Chase Bus Company. Nelson T. Brown, vice-president of the Philadelphia Rural Transit Company, said that his company was having 73 buses constructed, several of which could be placed in service at once.

News Notes

Arbiters Disapprove Wage Petition.—A board of arbitration, of which John Hays Hammond is chairman, announced on April 3 its disapproval of a petition made by the trainmen of the Capital Traction Company, Washington, D. C., for an increase in pay. The board recommended a continuance until March, 1926, of this agreement. The men asked for a straight rate of 70 cents an hour as a substitute for the existing agreement, under which they are paid 52 cents an hour for the first three months of employment, 56 cents an hour for the next nine months and 58 cents an hour thereafter. The company made a counter-proposal that the scale be reduced to the one in effect in March, 1923. This ranged from 50 cents an hour for the first year to 56 cents an hour after three years' service. The board suggested that representatives of employer and employees meet to consider working hours and to interpret the wage scale.

Wants Seven-Cent Fares. — The Elmira Water, Light & Railroad Company, Elmira, N. Y., recently filed with the Public Service Commission an application for permission to put into effect by May 1 a 7-cent fare. The company is now charging a 6-cent fare. Some weeks ago it asked the commission to determine a reasonable fare. This application is now pending. Application for a 7-cent fare is made now in order that an increase in wages may be made to some of the employees, the petition says. It is proposed to increase the wages of trainmen about 5 cents an hour and grant increases to some other employees of the railway department. At present the trainmen receive 40 cents an hour as the maximum.

Fares Reduced by Detroit United.—The Detroit United Railway, Detroit, Mich., on April 6 announced a cut in fares of 25 cents between Mount Clemens and its Detroit terminal at Connors Creek to all purchasers of twelve trip tickets. A single fare was previously 45 cents, including 10 cents bus fare into the city.

Commutation Books Sold.—The Bamberger Electric Railroad, Salt Lake City, Utah, is issuing commutation books for the use of passengers, which will be transferable, making them good for individual use regardless of purchaser. This policy, effective April 1, is adopted at the request of some of the company's patrons and will be in effect for a trial period of 90 days, at the end of which time decision will be made as to its continuance.

Transfer Privileges Curtailed. — Announcement was made recently, by the Pittsburgh Railways, Pittsburgh, Pa., that the privileges of the extended area of the 10-cent special transfer would be withdrawn following the end of the trial period. While officials felt that the 10-cent transfer met a long felt need in the city of Pittsburgh, it is said the revenues of the company at this time are insufficient to permit the permanent adoption of this system, without further investigation as to its effect upon the daily receipts.

Fare Changes in Effect.—The Public Service Railway, Newark, N. J., has filed with the Board of Public Utility Commissioners of New Jersey a new tariff, which through a change in zones extends the 5-cent fare on the Broadway line in Camden, N. J. Under the new fare plan there will be a 10-cent fare between Westville and Camden instead of an 18-cent rate, a 15-cent fare between National Park and Camden instead of an 18-cent fare and a 15-cent fare between Blackwood and Woodbury instead of a 16-cent rate.

Wage Agreement Renewed. — The Morris County Traction Company, Dover, N. J., has renewed the wage agreement with its men. The contract expired on March 31. Under it trainmen received 50 cents an hour for the first three months, 53 cents the next nine months and 55 cents after the first year. The men sought an advance of 15 cents an hour. After the facts had all been laid before them the men agreed to an extension of the terms for a year without any change in pay.

Foreign News

Metropolitan Railway Revenue Increases

A dividend of 3 per cent for the second half of 1924 has been declared by the Metropolitan Railway, London, England, making 5 per cent dividend for the year. For 1923 only 4 per cent was paid. The general reserve has been credited with £25,000, against £15,000 in the previous year and £51,000 carried forward, as against £35,250 last year.

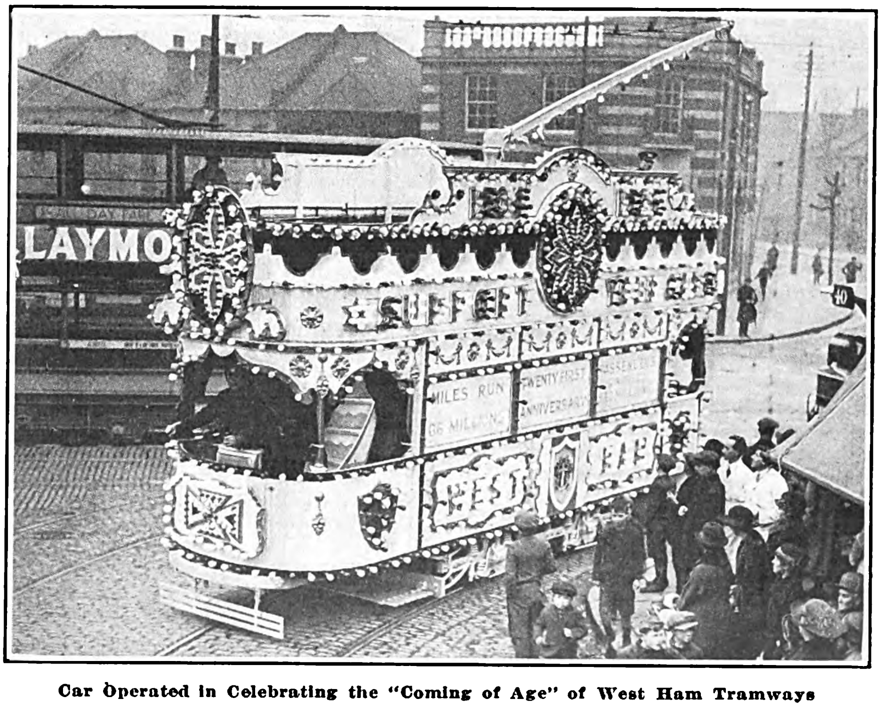
The developments of this company are reflected in the gradual increase of dividend payments, which seven years ago were only 1 per cent. The British Empire Exhibition at Wembley last year added much to the receipts. The Metropolitan Railway is independent of the Underground Railways group.

West Ham, England, Celebrates Birthday

A celebration costing about £600 was staged recently by the West Ham Tramways in honor of its 21st birthday. A brilliantly illuminated white car was paraded through the streets, displaying the information that 66,000,000 miles have been operated and 842,000,000 passengers carried since the inauguration of tramway service. As shown in the accompanying illustration, the car also bore the slogan, "Support Your Cars," and the dates 1904 and 1925, outlined in vari-colored electric lights.

Croydon Tramway Losses.—A loss of £54,000 was shown in the annual report of the Croydon Tramways, largely due to competition of motor buses and loss of traffic caused by track reconstruction. Early in 1925 cheap mid-day fares were introduced, but, according to the chairman of the tramway committee, this has been a failure. Arrangements are being made with the London County Council for through service from London to Brighton in competition with express bus service.

Standard Rail Section for Sleeper Tracks. — The British Engineering Standards Association is being asked by the Municipal Tramways Association and the Tramways and Light Railways Association to prepare a standard spcification section of rail for use on sleeper tracks.



Car Operated in Celebrating the "Coming of Age" of West Ham Tramways

Financial and Corporate

Slight Loss in Net at Albany

Review of Report of United Traction and Other Delaware & Hudson Electric Railway Properties

Operating revenues of the United Traction Company, Albany, N. Y., from all sources during 1924 were $3,205,856, operating expenses $2,739,408 and taxes $336,840. Operating income was $129,608, compared with $149,712 in 1923, a decrease of $20,104. Operating revenues decreased $28,293, or 1 per cent, as compared with the preceding year. Operating expenses decreased $67,312, or 2 per cent, and taxes increased $59,123, or 21 per cent. In operating revenues a loss of $36,425 resulted from decreased sales of power to other companies, but this was partially offset by an increase of 207,178 in the number of passengers carried, from whom revenue in the amount of $10,351 was earned.

Among the items of decreased operating expenses were: Injuries and damages, $38,300; paving, $54,013; transportation expenses, $13,733; power purchased, $15,054; removal of snow and ice, $36,685. But these were partly offset by the following increases: Maintenance of structures, $3,446; maintenance of power and line, $4,451; equipment retirements, $71,617, and track and roadway labor, $12,009.

The company's proportion of the cost of new pavement laid in 1924 was $212,759, of which $31,524 was chargeable to operating expenses and the balance to cost of property used in the public service. Reconstruction of tracks made necessary by a continuation of extensive street paving programs cost the company $330,165, requiring charges to operating expenses of $114,205. When the municipalities of Cohoes and Rensselaer decided to carry out during 1924 paving programs which would involve an expenditure of $117,000 on the part of the company for new tracks, structures and pavement, the management concluded that the volume of business did not justify such extensive participation and the tracks in this region were abandoned. Gasoline bus lines were substituted in Rensselaer and trackless trolley lines in Cohoes.

Operating revenues of the Hudson Valley Railway during 1924 were $910,215, operating expenses $935,025 and taxes $95,580. For the year there was a deficit of $120,390, compared with an income of $15,826 in 1923, a decrease of $136,216. Operating revenues decreased $50,893, or 5 per cent, from the preceding year; operating expenses increased $56,743, or 6 per cent, and taxes increased $28,580, or 43 per cent. Extensive use of automobiles is the principal factor in the decrease in operating revenues. In 1924 the municipality of Glens Falls engaged in a street paving program that cost the company $19,098, of which $2,901 had to be charged to operating expenses

Operating revenues of the Plattsburgh Traction Company were $30,562,

and $16,197 to capital.

operating expenses $31,920 and taxes $2,310. For the year there was a deficit of $3,668, compared with an operating income of $98 in 1923, a decrease of $3,766. Operating revenues decreased $2,682, or 8 per cent, from the preceding year; operating expenses increased $881, or 3 per cent, and taxes increased $203, or 10 per cent. It is explained that on account of continued and inevitable losses in the operation of this property it has been decided to close operations and to recover whatever portion of the capital represented may be practicable through its sale or salvage.

Operating revenues of the Troy & New England Railway were $25,235, operating expenses $21,345 and taxes $3,150. Operating income for the year was $740, compared with $7,082 in 1923, a decrease of $6,342. Operating revenues decreased $4,838, or 16 per cent, from the preceding year. Operating expenses increased $355, or 2 per cent. Taxes increased $1,149, or 57 per cent. It is explained that the management, convinced that profitable operation of the property is impracticable, has decided to discontinue the service and to "recover whatever is practicable out of capital by salvage." This is a 10-mile road between Troy and Averill Park.

The facts just reviewed are all contained in the annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1924, advance copy of which was released for publication on April 1. No separate statements of earnings of the electric railways controlled by the company were contained in the report.

$940,000 Improvement by Public Service Railway

Earnings for 1924, Although Recording Deficit, Show Remarkable Change for Better—More Five-Cent Fares—About 15 per Cent of All Passengers Handled on Buses—Outlook Good

EARNINGS of the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1924, were the largest in the history of the company. Gross earnings were $87,689,453 and the net increase in surplus was $5,583,072 before the payment of common stock dividends but after $2,430,046 had been paid on the preferred. The total amount of the common stock dividends was $2,959,329. Quarterly dividends at the rate of $1 a share were paid on the common stock for the first three quarters and at the rate of $1.25 a share for the last quarter.

In many respects the year 1924 was the most important in the history of the corporation. One of the big things achieved was the revamping of the corporation's financial structure under the advice of Drexel & Company, Philadelphia, and Bonbright & Company, Inc., New York, the corporation's bankers, so that several avenues of financing are provided with which to meet the corporation's constantly increasing requirements for new capital.

A decided improvement is reported in the status of the Public Service Railway. The company explains that as a result of a close study of operating conditions it was possible to effect economies which, while maintaining

INCOME ACCOUNT OF THE PUBLIC SERVICE RAILWAY FOR THE TWELVE MONTHS ENDED DEC. 31, 1924

	Public Service Railway	Public Service Railroad	Public Service Transportation and Subsidiary Companies	Other Affiliated Companies	Total
Operating revenues	$22,473,842	$304,602	$4,133,120	$1,345,612	$28,257,177
Operating expenses	11,358,905	98,078	2,759,656	607,375	14,824,017
Maintenance	3,405,155	66,703	1,439,842	57,752	4,969,452
Taxes	2,181,752	50,704	237,567	129,846	2,599,870
Amortization charges	801,888	....	510,126	107,500	1,419,515
Operating revenue deductions	17,747,702	215,486	4,947,193	902,474	23,812,855
Operating income	4,726,139	89,116	814,072‡	443,138	4,444,321
Non-operating income (exclusive of dividends of affiliated companies)	140,153	793	2,832	17,252	161,031
Gross income	4,866,293	89,910	811,240‡	460,390	4,605,353
Income deductions (bond interest, rentals and miscellaneous interest charges)	5,126,586	119,616	28,352	65,635	5,340,191
Net income or loss	260,293‡	29,706‡	839,592‡	394,754	734,838‡
Profit and loss accounts (excluding dividends)	**2,401,782*	....	41*	140	2,401,684*
Surplus (before dividends)	2,141,489	29,706‡	839,550‡	394,614	1,666,846
Intercompany dividends	284,624*	....	....	284,624	....
	2,426,113	29,706‡	839,550‡	109,990	1,666,846
Dividend paid unaffiliated interests (Directors)	....	....	....	176	176
Net increase or decrease in surplus	$2,426,113	$29,706‡	$839,550‡	$109,814	$1,666,670

‡—Deficit. *—Credit. **—Includes credit of $2,358,728.96 from sale of Public Service Terminal to Public Service Corporation of New Jersey.

OPERATING REVENUE OF SUBSIDIARY COMPANIES OF PUBLIC SERVICE CORPORATION OF NEW JERSEY FOR TWELVE YEARS

Year	Electric Properties	Gas Properties	Transportation Properties	Total
*1913	$8,500,122	$9,960,937	$16,131,414	$34,592,473
1914	9,293,661	10,320,536	16,310,255	35,924,453
*1915	10,425,851	10,475,933	16,569,443	37,471,228
1916	12,814,597	11,558,413	18,175,764	42,548,775
1917	15,168,255	12,729,060	19,394,025	47,291,342
1918	17,587,806	14,578,269	20,831,762	52,997,838
1919	20,054,659	14,941,745	24,140,356	59,136,762
1920	23,563,929	20,872,062	27,882,095	72,318,087
1921	24,390,321	23,516,318	27,404,867	75,311,507
1922	27,660,026	23,152,426	27,544,509	78,356,962
1923	31,188,595	24,814,283	23,105,003	79,108,882
1924	34,889,632	24,542,643	28,257,177	87,689,453

* Change in classification of accounts effective Jan. 1.

former high standards of service and bettering the physical condition of equipment, caused a reduction in operating expenses sufficient to prevent a deficit in the income statement for the year. Not including a credit of $2,358,728 from the sale of the Public Service Terminal to the Public Service Corporation, the loss on railway and affiliated operations for the year was $734,838, compared with a loss of $1,675,534 for 1923.

Cars to the number of 951 were completely overhauled in the company's shops; 1,202 were repainted, and 1,216 motors were rebuilt; 19.7 miles of track was reconstructed with new rail; 7.8 miles with old rail; 2.3 miles of track extensions were made; 72 miles of new trolley wire installed, and the feeder system was extended to four new substations.

The use of one-man cars equipped with safety and labor saving devices has been largely extended. Whereas at the first of the year only 46 per cent of the cars in service were one-man operated, at the end of the year the number was 86 per cent of the total. The company says this change has not interfered with the quality of service, but has resulted in a higher average wage for operators and has substantially reduced expenses.

To make these results possible 1,023 cars went through the company's shops to be made over for one-man operation, the alterations including the installation of pneumatic door opening devices, the removal of bulkheads and bulkhead doors and the lengthening and reversing of car platforms.

Work done in the company's shops included not only the ordinary and extraordinary construction and repair work, but the building of 58 bodies for bus chassis owned by the Public Service Transportation Company, a record made possible because of the ample shop facilities available in both the northern and southern districts of the railway system.

Current recording meters were installed upon 1,133 cars, bringing the total of cars so equipped up to 1,700. Use of the meters resulted in a saving of current amounting to 4.85 per cent of the total power bill, although the number of passengers per car-mile largely increased.

It has been the policy of the company, where service could be improved and economy effected thereby, to substitute bus for car service, and this has been done in part or in whole on thirteen lines in various places on the system where traffic was light and capable of being efficiently handled by buses. This has in some instances permitted a saving through relief from track and maintenance charges. Track removed during the year totaled 7.6 miles, leaving the mileage of the Public Service Railway on Dec. 31 at 838,640, in addition to 49.632 miles owned by the Public Service Railroad, a total of 888.272 miles.

STATEMENT OF MILEAGE OF THE PUBLIC SERVICE RAILWAY DEC. 31, 1924

	Miles
First main track	530.834
Second main track and turnouts	298.161
Connections, crossovers, wyes and loops	12.375
Carhouse and yard tracks	46.902
Total	888.272

Total number of passenger cars available for operation:

Closed	Open
1897	399

Number of new passenger cars since 1903:

Closed	Open
1493	327

	Miles
Track reconstructed with new rail during 1924	19.721
Track reconstructed with same rail during 1924	7.811
Extensions built during 1924	2.32

It was found possible during the year to discontinue the use of the Hoboken and Pavonia carhouses. The cars formerly operated from them were assigned to other houses in the vicinity without interference with service. At the same time the use of the Broadway Terminal, Paterson, as an operating terminal was done away with and Paterson cars are now all operated from the Market Street carhouse.

The 5-cent unit plan of fares recommended by the State Board of Public Utility Commissioners and adopted for certain of its lines by the company in 1923 was put into effect upon other lines during 1924, notably the entire Central Division and on additional lines in the Essex and Passaic Divisions. The company says the 5-cent rate is substantially equivalent to the rate in existence at the time of its adoption, but that the use of the nickel unit makes collection easier and more speedy.

BUS OPERATIONS REVIEWED

Progress was made during the year in forwarding the plan for a co-ordinated system of cars and buses. Many vehicles have been purchased from former operators and the company's original purchase of 100 new, modern buses was supplemented by an order for a second 100 of the same general type, delivery of which is now being made. Many of the buses taken over were in poor condition, the facilities for the rehabilitation were not on hand and for a time it was difficult to keep a sufficient number of vehicles on the streets to maintain schedules.

To overcome this difficulty there was established in the Day-Elder factory building at Irvington, recently purchased, a completely equipped bus repair shop with a capacity of 50 buses, in which it is possible to maintain and rehabilitate equipment in accordance with the high standard set. In the meantime an organization has been assembled which will be able to handle repair and overhauling work much more effectively and economically than was before possible.

A number of large garages for the storage, dispatching and minor maintenance of buses has since been secured. On the Essex Division two bays of the Hilton carhouse have been converted for bus use by the construction of concrete floors over the pits and the installation of heating and lighting systems; a suitable building in Queen Street, Newark, has been leased and remodeled, and part of the Orange and Passaic Valley carhouse in Orange has been converted for garage purposes.

In the Passaic Division the Lakeview carhouse in Paterson has been fitted up and makes a commodious garage admirably suited to its purpose. In the Southern Division a new bay was added to the Newton Avenue carhouse

TRANSPORTATION STATISTICS OF PUBLIC SERVICE RAILWAY FOR TWELVE YEARS

Year	Trolley Passengers	Bus Passengers	Total Passengers	Trolley Mileage	Bus Mileage	Total Mileage	Trolley-Hours	Bus-Hours	Total Hours	Passenger Receipts per Trolley-Mile, Cents	Passenger Receipts per Bus-Mile, Cents
1913	404,411,105	....	404,411,105	49,853,408	....	49,853,408	5,696,066	....	5,696,066	30.97	.....
1914	407,277,914	....	407,277,914	50,792,889	....	50,792,889	5,665,119	....	5,665,119	30.72	.....
1915	414,422,040	....	414,422,040	51,873,660	....	51,873,660	5,573,670	....	5,573,670	30.49	.....
1916	451,698,012	....	451,698,012	54,964,708	....	54,964,708	5,911,131	....	5,911,131	31.37	.....
1917	476,974,983	....	476,974,983	56,087,403	....	56,087,403	6,021,225	....	6,021,225	32.44	.....
1918	451,220,806	....	451,220,806	54,039,150	....	54,039,150	5,698,089	....	5,698,089	36.00	.....
*1919	396,689,234	....	396,689,234	57,644,927	....	57,644,927	6,039,453	....	6,039,453	39.29	.....
1920	453,534,694	....	453,534,694	60,798,743	....	60,798,743	6,539,207	....	6,539,207	43.21	.....
1921	435,679,801	....	435,679,801	58,309,883	....	58,309,883	6,212,276	....	6,212,276	44.11	.....
1922	410,212,814	....	410,212,814	56,419,982	....	56,419,982	5,983,122	....	5,983,122	45.59	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75	22.26
1924	427,828,444	79,383,643	507,212,087	53,945,515	15,669,848	69,615,363	5,662,340	1,928,498	7,590,838	41.04	26.06

* Mile zone system in effect from Sept. 14 to Dec. 7.

and alterations were made to the original north bay, providing ample accommodations. In addition, a number of smaller garages have been secured and are being operated.

The company feels that with sufficient equipment, with the repair shop and garage facilities acquired, with the new buses in service and with the experience gained through operation, prospects are bright for a decided advance in bus operating results during the coming year.

RATES

During the year the litigation involving the rate of fare lawful to be charged by Public Service Railway was ended. On May 28 Judge Rellstab of the United States District Court signed a final decree declaring that the valuations placed upon the company's properties by the State Board of Public Utility Commissioners were far below true values for rate-making purposes and that the challenged rates based thereon were confiscatory and illegal.

On Nov. 12 the United States Supreme Court, pursuant to a stipulation signed by both plaintiff and defendant, dismissed the appeal taken by the board from the decision of the special tribunal which, in October, 1921, granted a preliminary injunction restraining the board from carrying out its order fixing rates of fares.

The 5-cent unit schedule of fares which was put in effect on Oct. 1, 1923, at the suggestion of the utility board, for a period of four months has been continued and extended by the company and it is the intention to still further apply it as conditions warrant.

During the year the Public Service Railway retired $408,000 of equipment trust certificates of series "D," "E" and "F" in accordance with the equipment trust agreements. The $1,291,000 North Hudson County Railway 5 per cent improvement mortgage bonds maturing May 1, 1924, were extended for two years at 6 per cent.

$899,617 Balance for Year for Illinois Power & Light

Clement Studebaker, Jr., president of the Illinois Power & Light Corporation, Chicago, Ill., explains in presenting the annual report for the year ended Dec. 31, 1924, that the financial position of the company has been steadily growing stronger since its organization, a large increase in working capital represented by net current assets having been attained during the year. Capital expenditures were made during the year in the amount of $11,284,363. Other than funds derived from earnings and the sale of preferred stock, those required for capital investment and refunding of maturing underlying bond issues were secured from the sale of first and refunding mortgage bonds on favorable terms. A reduction in the interest charge on bond financing occurred during the year when a block of $5,000,000 of bonds was sold in December bearing 5½ per cent, whereas the bonds sold early in the year were at the rate of 6 per cent. The market quotations of all of the company's securities have also steadily advanced as their strength from an investment standpoint has become better known.

DISTRIBUTION OF NET EARNINGS OF ILLINOIS POWER & LIGHT CORPORATION IN 1924

Total net earnings		$9,607,966
Less fixed charges:		
Interest charges, etc.	$4,975,922	
Bond discount amortized	207,024	5,182,946
Surplus available for dividends and depreciation		$4,425,019
Dividend on preferred stocks, Illinois Power & Light Corporation and subsidiary companies		1,633,721
		$2,791,297
Appropriated for depreciation, retirements, replacements, etc.		1,891,680
Balance		$899,617
Surplus, Jan. 1, 1924	$1,034,957	
Add adjustments	17,563	1,052,521
		$1,952,139
Dividends paid on common stock, 1924		700,000
Surplus per balance sheet		$1,252,139

While the first year, 1923, was one of consolidation and financing, the year 1924 was primarily one of organization and development of general policies looking to the strengthening and harmonizing of the various companies as an operating entity. The gross income was $29,184,288. Net earnings before the deduction of interest, dividends and allowances for depreciation were $9,607,966 and after all these allowances the balance carried forward was $899,617.

During 1924 the company acquired by purchase and incorporated into the system utility properties which are rendering to their communities different kinds of service such as electricity, gas, ice and in a few instances bus transportation.

Mr. Studebaker says the coming year gives promise of being one of continued advance in the various branches of the business. The large capital investments that were needed by the properties at the time they were consolidated into the present companies, some of which have been made or are under way, promise to produce adequate earnings on the capital invested and the directors feel that their best efforts should be put forth to insure the growth of the plants and facilities in proportion to the increasing demands of the communities served.

COMPARATIVE STATEMENT OF EARNINGS OF THE ILLINOIS POWER & LIGHT CORPORATION

	1920	1921	1922	1923	1924
Gross earnings:					
Electric light and power	$7,891,608	$9,209,945	$10,442,751	$12,400,996	$13,871,432
Gas	1,302,671	1,623,824	2,195,048	2,722,533	2,973,364
Interurban lines	7,175,660	7,161,772	6,939,641	6,676,610	6,032,489
City lines	4,714,116	4,596,796	4,506,913	5,178,391	4,849,246
Heat	557,246	527,454	574,258	620,363	685,777
Water	71,926	77,872	90,415	100,190	101,125
Miscellaneous	381,140	302,215	315,583	231,769	170,266
Other income	....	....	....	....	500,585
Total gross earnings	$22,094,370	$23,499,883	$25,064,611	$27,930,854	$29,184,288
Operating expenses, maintenance and taxes	16,352,776	17,066,428	17,746,168	18,811,807	19,576,322
Total net earnings	$5,741,594	$6,433,454	$7,318,442	$9,119,047	$9,607,966

Plattsburgh Property Sold

At a meeting of the Mayor's committee at Plattsburgh, N. Y., with H. B. Weatherwax, vice-president of the Plattsburgh Traction Company, John F. O'Brien, chairman of the board of the Plattsburgh National Bank & Trust Company and part owner of the Dock & Coal Company, offered to purchase the property of the Plattsburgh Traction Company for $10,000, subject to the existing liens. Operation will be continued by the present owners, the Delaware & Hudson Company, until May 1. At that time Mr. O'Brien will assume control. Mr. O'Brien said that he was taking over the Plattsburgh Traction Company as a civic duty, and that he had no intention of scrapping the lines as long as they pay operating expenses.

The situation confronting the Plattsburgh Traction Company is referred to in the review of the earnings of the Delaware & Hudson Company's electric railway properties elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL.

Verdict Favors Dissenting Manhattan Stockholders

The Appellate Division of the Supreme Court of New York decided on April 3 against the Interborough Rapid Transit Company, New York, in two cases on the subject of whether or not that corporation must pay 7 per cent dividends to the few holders of Manhattan Elevated Railway stock who had never assented to the "readjustment plan of May 1, 1922," whereby owners of about 95 per cent of that stock agreed voluntarily to accept dividends, beginning at 3 per cent, in 1922 and gradually working higher until now it is 5 per cent.

Phoenix System May Be Abandoned

The Phoenix Railway, Phoenix, Ariz., contemplates giving up its franchise and junking its system. No reason has been given for the move except that the railway company has been losing money in the operation of its lines. The city some time ago charged the company with failure to live up to its franchise obligations. The case of the city to revoke the franchise is in the Superior Court.

In the meantime the Phoenix Motor Coach, Inc., and the City Transit Company are seeking permits to operate buses on the city streets. The application of the City Transit Company has been on file for some time. It calls for the operation of four trunk line bus routes covering practically the same routes traversed by the railway with feeders to other sections of the city. The City Transit plans to run 14 standard type 29-passenger buses with three coaches in reserve. It is the intention of the City Transit Company, should it be given the permit, to request the City Commission to place on the ballot to be voted on by the people in May, 1926, an ordinance for an exclusive franchise to operate buses in the city for a period of years, subject to certain terms and conditions to be worked out at a later date.

Phoenix is a city of 30,000. The railway has been operating 32 miles of line.

Earnings Decline

Columbus Railway Reports $200,000 Decrease in Net—Decline in Traffic —$5,000,000 on Rehabilitation

The net balance in the treasury of the Columbus Railway, Power & Light Company, Columbus, Ohio, at the end of the year 1924 was $566,602. In 1923 the net balance was $768,966, or a decrease for 1924 of $202,364. The gross income also fell off $43,413. These facts were revealed in the annual report of Norman McD. Crawford, the treasurer, to the stockholders. The operating expenses in 1924 were slightly higher than in 1923. Evidences of the company's carrying out a thorough rehabilitation program during the year 1924 are noted in the fact that total expenses charged to capital account amounted to $5,545,638. The principal items included affecting railway operation were $510,536 for track and roadway expenses, $2,842,834 for power stations and substations and $434,743 for a general office building. With the depreciation reckoned at $653,902 the total chargeable to property account was $4,891,736.

INCOME ACCOUNT OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1924	1923
Railway operating revenues..	$3,494,760	$3,702,221
Power, light and heat operating revenues...........	4,867,815	4,749,233
Non-operating revenues.....	26,615	11,268
Total gross revenues......	$8,389,191	$8,462,724
Operating expenses.........	$4,956,324	$4,955,526
Taxes.....................	808,545	839,461
Gross income............	$2,624,322	$2,667,735
Deductions from gross income:		
Interest on funded debt.....	$868,929	$806,733
Interest on unfunded debt...	53,266	13,354
Other deductions...........	64,942	62,042
Total deductions.........	$987,139	$882,130
Net income available for sinking fund dividends and other financial requirements...............	$1,637,182	$1,785,604
Deductions from net income:		
Sinking fund...............	$287,439	$233,650
Dividends—		
Series A preferred stock....	121,636	121,636
Series B preferred stock....	301,123	300,998
Common stock............	360,381	360,354
Balance (credit to profit and loss account)...........	$566,602	$768,966

PROFIT AND LOSS ACCOUNT OF THE COLUMBUS RAILWAY, POWER LIGHT COMPANY

	1924	1923
Balance at beginning of year	$1,847,327	$1,467,196
Credits		
Balance from each year's operations............	566,602	768,966
Delayed income credits...	3,762	16,589
Miscellaneous credits.....	786,690	2,009
Total credits...........	$3,204,383	$2,254,762
Debits:		
Dividends (paid in stock):		
Series A preferred stock.	$........	$........
Series B preferred stock	....	....
Delayed income debits....	27,584	28,480
Miscellaneous debits......	123,072	378,954
Total debits...........	$150,656	$407,434
Balance at end of year..	$3,053,726	$1,847,327

TRAFFIC STATISTICS OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1924	1923
Revenue passengers.........	66,548,546	70,177,236
Transfer passengers.........	16,722,852	17,342,632
Total passengers.........	83,271,398	87,519,868
Per cent of transfers to total passengers.............	20.08	19.82
Revenue per revenue passenger in cents............	5.09	5.08
Revenue per passenger including transfers, in cents	4.08	4.08
Car mileage..............	9,515,369	9,377,377

An accompanying table shows the traffic statistics for the years 1924 and 1923. The year 1924 has been the poorest month in the matter of total passengers carried compared with the preceding years. In 1920, 91,760,315 passengers were carried; in 1921, 85,446,483, in 1922, 85,588,813, in 1923, 87,519,868, and in 1924, 83,271,398. These figures refer to total passengers. Yet the number of transfer passengers was higher in 1924 than it was in 1920 and in 1921 but below the record in 1922 and 1923.

The revenue per revenue passenger in cents in 1924 was 5.09 higher than any of the four preceding years. Car mileage also was higher in 1924. In 1920 the car mileage was 8,747,000; in 1921, 8,516,300; in 1922, 9,021,024; in 1923, 9,377,377, and in 1924, 9,515,369.

Negotiations Rather than Arbitration at Winnipeg

It is understood that the city of Winnipeg, Man., through its special rail committee, will enter direct negotiation rather than arbitration for taking over the street railway in 1927. According to the *Canadian Financial Post* the members of the committee will first ascertain what properties the company would turn over with its traction system and the price it would be prepared to take before discussing in detail the question of purchasing. In the meantime all data pertaining to the valuation of the system and separation of properties will be compiled and submitted to the Aldermen for close study.

These data will include copies of bylaw 543, which contains the whole contract for operation of the rail system in Winnipeg, judgment of the Privy Council on the portion of the Pinawa power plant rightly chargeable to the transportation system, valuation of the physical properties made by the Public Utilities Commission and a copy of the draft agreement drawn up two years ago.

Deficit of $210,849.—For the year ended Dec. 31, 1924, the Sacramento Northern Railroad, Sacramento, Cal., reports railway operating revenues of $1,403,281 with operating expenses $1,302,441. The net revenue was $100,840 and the operating income $14,852. The gross income was $46,389. After the deductions from gross income the income deficit transferred to profit and loss was $210,849.

Tax Lien of $720,683 Against D. U. R.—A tax lien for $720,683, has been placed on the properties of the Detroit United Railway, Detroit, Mich., by one of the United States collectors of internal revenue. It represents additional income taxes which the United States government claims is due for the years 1917, 1918 and 1923. The Security Trust Company, one of the receivers, says that the claim is being contested by its attorneys, and that tax officials are in Washington in conference with the revenue officials on this matter.

Deficit in February.—After showing a profit for two successive months, the first recorded since the service-at-cost-franchise became effective, the earnings of the Youngstown Municipal Railway, Youngstown, Ohio, for February showed a deficit of $7,477. The number of passengers carried in February was 2,783,069, compared with 3,089,708 in January and approximately 2,900,000 for December. The deficit in the stabilizing fund on March 1 was reported to be $1,242,422.

Earnings of Spokane Lines Off.—No separate statement of earnings of its railway lines is contained in the report of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1924. Gross revenues were $5,299,926 and the surplus for the year $1,666,741. After the payment of dividends the surplus was $41,181. D. L. Huntington, president, in referring to the Spokane United Railways, in which the Washington Water Power Company has a substantial interest, said that it had an unsatisfactory year of operation. He said that the decrease in revenue mentioned in the report of the previous year due to the increased use of automobiles continued through 1924, with the result that the revenues of that property decreased $103,265, offset only in part by operating economies.

Consultants for Detroit United.—A. L. Drum & Company, Chicago, Ill., have been retained as consultants by the receivers for the Detroit United Railway, Detroit, Mich., to advise on the reorganization of the property and on steps for building the business up to a profitable basis.

Cumulative Vote Used to Elect Dayton City Directors.—Thomas A. Ferneding, former secretary of the City Railway, Dayton, Ohio, by combining his strength with that of Henry Mead, had both himself and Mr. Mead elected as directors of the company at the recent annual meeting by using the cumulative vote. At the meeting Harrie P. Clegg, J. Sprigg McMahon and G. H. Gorman failed of election. Valentine Winters, president of the company, continues as a director and as president of the company.

Measure Aims at Revaluation.—A measure looking toward a revaluation of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was introduced in the Senate on April 4 by Senator Horace Schantz of Lehigh. It appropriated $100,000 to finance such investigations. Such a fund would provide the Public Service Commission with the means of complying with the recommendations of Dr. Milo R. Maltbie for a definite valuation. Under the measure the commission is given authority to expend the appropriation in any manner necessary to investigate and appraise utilities when such information is required on which to fix rates.

Preferred Dividends on Regular Basis.—The directors of the Louisville Railway, Louisville, Ky., recently voted a dividend of 2½ per cent on the preferred stock. The dividend is payable on April 10 to stockholders of record on March 26. The last of the deferred dividends on the preferred stock was cleaned up last December. The action of the company in getting preferred dividends back on a regular basis has resulted in a material advance in the quotation on the common stock.

Merger Plan Perfected.— Confirmation of the purchase of five Pennsylvania and New Jersey public utility companies by A. E. Fitkin & Company, New York, has been announced. The companies involved are the Scranton Railway, Altoona & Logan Valley Electric Railway, Carbondale Gas of Pennsylvania, Monmouth Lighting and the Shore Lighting of New Jersey. The proposal to take these properties over was reviewed at length in the ELECTRIC RAILWAY JOURNAL for March 14, page 428.

Par Offered for Municipal Service Holdings.—The Keystone Public Service Corporation, into which the Fitkin interests of New York have merged their recently acquired Pennsylvania properties, probably will take over the traction, power and light systems of the Municipal Service Corporation in that state. The Georgia and Virginia systems probably will be taken over by a new corporation to be organized in the near future. It is understood that holders of the common stock of the Municipal Service Company will receive more than $100 a share for their stock. The agreement of the purchase provides for the delivery of 75 per cent of the 60,000 shares outstanding to A. E. Fitkin & Company, who agreed to take 100 per cent. Reference to this proposed purchase was made in the ELECTRIC RAILWAY JOURNAL for April 4, page 563. The railway properties involved in the deal are the Citizens' Traction Company, Oil City and Franklin, Pa.; the York Railways, York, Pa., and the Youngstown & Suburban Railway, Youngstown, Ohio.

$20,000,000 Paid for Scranton and Other Properties.—Van Horn Ely, president of the American Electric Power Company, Philadelphia, Pa., is quoted as authority for the statement that the price of the properties recently sold to A. E. Fitkin & Company, New York, was about $20,000 000. The company is calling for payment four bond issues totaling $4,850.000 on July 1 and Sept. 1. Among the properties to change hands were the Scranton Railway, Dunmore-Moosic Lake Railroad, Scranton Bus Company, Altoona & Logan Valley Electric Railway, Lake-Mont Park Company and Logan Valley Bus Company. The negotiations which resulted in this sale were reviewed in the ELECTRIC RAILWAY JOURNAL for March 14, page 428.

Book Reviews

Growth of American Trade Unions 1880-1923

By Leo Wolman. Published by National Bureau of Economic Research, Inc., 474 W. 24th Street, New York, N. Y., 1924. 170 pages. $3.

Beginning with the birth of the Federation of Organized Trade and Labor Unions, the direct forerunner of the present American Federation of Labor, at Pittsburgh in November, 1881, this book traces the history of organized labor in the United States down to the present time. In determining the facts here presented, the National Bureau of Economic Research has followed its policy of providing men of all shades of opinion with objective knowledge of actual conditions. It has confined itself to stating facts as it found them. With opinions about the promise or the danger to American life from the growth of trade unions the book does not concern itself.

In a foreword by W. C. Mitchell, professor of economics Columbia University, the reason why this task was undertaken is explained. The first work essayed by the National Bureau of Economic Research was to determine as accurately as possible the size and distribution of the income produced and consumed by the people of the United States. Among the problems encountered in this research was that of the fluctuations in the national income from year to year. What produced these fluctuations? How were they shared by the various classes of income receivers? After the report dealing with the size and distribution of income had been published a new series of investigations was begun, dealing with income fluctuations. This study of the growth of American trade unions from 1880 to 1923 is an outgrowth of these investigations.

Changes in membership of American trade unions in the past 44 years are described. Analyses are given of the relation between the business cycle and changes in union membership. Tables indicate for each union and for each year its state of affiliation with or independence of the American Federation of Labor. In order to indicate the general nature of the growth or decline of the labor movement before 1897, incomplete series of membership statistics are presented from 1880 to 1897.

Twice during the last half century the membership of the American trade unions has reached remarkable peaks, from which it has later descended. The first peak was achieved in 1887, when its membership rose to about 1,000,000; the second in 1920, when it exceeded 5,000,000. In each case the labor movement failed to hold its maximum number. Reasons for these fluctuations are explained at length in the book.

To enable the reader better to understand the character of the American labor movement detailed descriptions are given of the changes in membership of fourteen groups of unions and of the most important unions within each group. Several interesting facts are brought to light in the author's analysis of the transportation group. For example, both the electric railway employees' union and the teamsters' organization participated in the general increase of membership in the transportation group during the years 1919 and 1920. Electric railway employees gained 40,000 members and the teamsters 55,000. But in the subsequent period of general decline the teamsters lost 40,000 members, while the electric railway employees more than held their own.

Tables and charts are presented showing the growth of other unions and groups of unions. Total membership figures for the years 1914 to 1923 are given for the trade unions of Australia, Canada, France, Germany, Italy, Holland and the United Kingdom. Comparisons are made also between the membership of trade unions and the numbers of people who are gainfully employed in industry. A chapter is devoted to a study of women in the American labor movement. While these latter subjects are perhaps not of direct concern to those interested primarily in the electric railway industry, they are details necessary to give a fair picture of the general situation.

All in all, this book is an interesting and valuable contribution to the study of the labor question in America. Its value is enhanced by the fact that it deals only with facts and avoids the expression of opinion. Its publication by the National Bureau of Economic Research provides a handy reference work for any business executive employing large numbers of workers.

Skinner's Mathematical Theory of Investment

By E. B. Skinner. Revised edition. Published by Ginn & Company, Boston, Mass. 269 pages. $3.40.

This is a revised edition of a well-known treatise brought out ten years ago. Two important changes distinguish the new edition: the more extensive use of the method of interpolation with one new chapter on the subject, and much new material on depreciation. Perhaps the greatest appeal of the book to engineers, public utility experts and steam and electric railway operators is made by this new chapter. In many respects the book is unusual as a contribution to investment literature. Its value appears to lie not so much in what is contained that is new as in the presentation in organized form of the mathematical chapters needed by insurance companies, investment bankers, and public service commissions. The object of the book is to familiarize the student of business or of public affairs with the mathematical material used in the modern office. The theory of interest, both simple and compound, the amortization of debts by various plans, the theory of bond values, depreciation, sinking funds, inheritance taxes, old-age pensions, and life insurance are among the subjects treated. The book is concluded with valuable tables.

Railway Electrification

By H. F. Trewman. New York: Sir Isaac Pitman & Sons, Ltd. 244 pages, illustrated.

In a very clear manner the economics of railroad electrification are discussed. Systems in vogue are analyzed and costs are stated. The conclusion is that, in England particularly, electrification is profitable for all large terminals, for all roads within a 25-mile radius of large cities and for heavy-density trunk lines where freight haulage predominates. The direct-current system is favored for terminal and suburban electrification, and the author advocates a standard gage and standard electrification system. He computes a national saving in fuel of 60 per cent, but shows that capital investments required for complete electrification are so large that only piecemeal methods should be used in the electrification of English roads. The book is a valuable addition to the economics of railroad electrification.

Bus Operating Practice

By Hauer and Scragg. Published by the International Motor Company. American News Company, New York, distributor. 260 pages.

Numerous charts and other illustrations are used by the International Motors Company to add to the forcefulness of the record of the more important problems that confront bus-operating companies as set down in the book "Bus Operating Practice," by Hauer and Scragg. Although the record was brought together by a bus manufacturer the book really has all the value and dignity of a reference treatise. In a simple and direct fashion the growth of the bus industry is traced, and then all the important things that would come up in operation are considered in order, among them routes, operating permits, passenger terminals and selling the service.

The chapter headings, after all, probably give the best idea of the subjects it has been attempted to cover, which for that matter really have been covered in a readable and authoritative way so far as the development of the business has provided a background from which to draw lessons and form conclusions. These headings are: The Growth of the Bus Industry, Selecting Profitable Bus Field, Securing the Right to Run, Passenger Terminals and Waiting Rooms, Selling the Service, Operation, Indirect and Supplementary Service, Costs, Selection of Equipment.

City Will Help Oklahoma Railway

City Commissioners of Oklahoma City, Okla., are quoted as having given assurance that they will co-operate fully in trying out the remedies for the ills of the Oklahoma Railway recommended by the experts who have made a report in the matter. Co-operation of the city will involve amendment of parking rules and enforcing of traffic law provisions. George A. Henshaw, one of the receivers, says that steps will be taken immediately to carry into effect changes recommended by the report of the engineers. Whether the reformation of operating plans will include abandonment of the terminal station, which was recommended in the original report, is not certain.

Personal Items

J. F. Egolf Heads Illinois Association

New President of the State Body Is the Operating Head of Aurora Elgin & Fox River Electric Company

J. F. Egolf, the new president of the Illinois Electric Railway Association, is general manager of the Aurora, Elgin & Fox River Electric Company. In that capacity he has had outstanding success in the establishment of favorable relations between the railway management and its employees, and through them with the company's power and railway customers. Under his management the properties with which he is connected have been rehabilitated and have passed from a period of financial stress and receivership to an era of improved service and brightened outlook.

J. F. Egolf

In his steady rise from a conductor on the Columbus Street Railway, Columbus, Ohio, in 1898, to general manager of the Fox River properties Mr. Egolf fitted himself for increased responsibility by close observation and study of transportation work outside of his immediate duties. Through personal experience in transportation, track, shop and accounting departments of the various properties with which he has been connected, he laid the foundation for detailed familiarity with the problems of each department. This, coupled with a close contact with his men and the ability to understand their viewpoint, while at the same time maintaining discipline and efficiency, has characterized his career. Mr. Egolf is an ardent advocate of the idea that the platform men are his transportation salesmen and attributes the success of his work on the Fox River properties to the development of that principle in the minds of his men.

After serving as conductor and motorman in Columbus from 1898 to 1902, Mr. Egolf entered the mechanical department of that property as a car repair man. In the spring of 1903 he went with the Columbus, Buckeye Lake & Newark Railway as a motorman, and again served for two years on the platform, after which he was transferred to the dispatcher's office. This company was later absorbed by the Ohio Electric Railway, whereupon Mr. Egolf was sent to Springfield, Ohio, as chief dispatcher. In 1907 he was appointed assistant superintendent.

Additional experience as dispatcher and chief dispatcher was obtained with the Chicago, Lake Shore & South Bend Railroad. In 1914 he was made manager of the Springfield & Xenia Railway by the Warren Bicknell Company, Cleveland, Ohio. In July, 1918, this company transferred him to the Interurban Railway & Terminal Company, where he had charge of all operations until 1922. In that year he became general manager for the receiver of the Fox River Division of the Aurora, Elgin & Chicago Railroad. This property was subsequently purchased by the Western United Corporation, and on Feb. 1, 1925, Stone & Webster were engaged to operate it along with all the other subsidaries of the Western United Corporation. Throughout these changes, Mr. Egolf has been retained as general manager, having charge, in that capacity, of all the railway property of the Aurora, Elgin & Fox River Electric Company and of the lighting property in Elgin.

H. S. Newton Heads Monongahela Industrial Department

Henry S. Newton, formerly manager of the Parkersburg-Marietta division of the Monongahela West Penn Public Service Company, with headquarters in Parkersburg, W. Va., has been placed in charge of a newly created industrial department. C. H. Hardesty, traffic manager of the company, has been designated as acting manager of the Parkersburg - Marietta division. Through the creation of this new industrial department the Monongahela West Penn system, with main offices at Fairmont, intends to take an active part in aiding the industrial development of northern West Virginia. It proposes, through its manager, to have contact with all industrial organizations, chambers of commerce, boards of trade and like organizations in securing and locating suitable industries along its lines.

Mr. Newton has been in the employ of the Monongahela West Penn Public Service Company since early in 1918 and has been in charge of the Parkersburg-Marietta division since 1919. He has been identified with the Ohio Valley Electric Railway, Huntington, W. Va.; the Mesaba Railway, Virginia, Minn.; the Hartford & Springfield Street Railway, Warehouse Point, Conn., and also with the Syracuse Street Railway, Syracuse, N. Y. In addition to these affiliations he was at one time general manager and chief engineer of the Syracuse, Lakeside & Baldwinsville Railroad and general manager of the Beaver Valley Traction Company.

Mr. Hardesty, who will be acting

manager of Mr. Newton's old territory, has been with the Monongahela company since December, 1917, and has been traffic manager since 1921. A department of traffic was created for Mr. Hardesty in 1922. His duties at that time were to control both the local and Parkersburg-Marietta division, the passenger, freight and express traffic. He also was assigned the duty of determining the rate on such traffic and was given supervision and direction of all passenger and freight offices and passenger and freight agents.

Gen. Lincoln C. Andrews Heads All Dry Enforcement

Supervision of the major federal agencies charged with the enforcement of the prohibition act was placed on April 1 in the hands of Gen. Lincoln C. Andrews, New York, receiver of the New York & Queens County Railway and other electric railway lines on Long Island.

Taking oath as an Assistant Secretary of the Treasury, General Andrews was given direct supervision over the prohibition unit, the coast guard and the customs service. All three of these agencies heretofore had been under the supervision of Assistant Secretary Moss.

As noted in the ELECTRIC RAILWAY JOURNAL for March 28 General Andrews has perfected arrangements to hold the receiverships.

A. L. Valentine with Seattle & Rainier Valley Property

A. L. Valentine is now engineer of maintenance of way of the Seattle & Rainier Valley Railway, Seattle, Wash. This position was formerly held by H. L. Hawkins, who was also master mechanic. A. Flannigan now is electrical engineer and master mechanic.

Mr. Valentine's career has been a very active one. When the Seattle Municipal Railway was put in operation he was in charge as superintendent of public utilities of Seattle. In 1886 he was employed by the Puget Sound & Grays Harbor Railroad as a member of the surveying party. For the next three years he was employed at the office of the city engineer of Seattle. Later he became associated with the Port Townsend Southern Railroad as engineer in charge of terminals and subsequently he was associated with the Northern Pacific Railway in connection with the Seattle terminals. During the years that followed Mr. Valentine was connected with the Oregon Improvement Company and the Columbia & Puget Sound Railroad, the Northern Pacific Coal Company and the Great Northern Railroad. In 1904 he was elected to the office of county engineer of King County, Wash., and two years later he was re-elected to this position. In the fall of 1909 Mr. Valentine was appointed superintendent of public utilities by Mayor John F. Miller to fill out an unexpired term, and on Jan. 1, 1910, he was appointed to a full term of three years. He was reappointed for a term of three years on Jan. 1, 1913, by Mayor George F. Cotterill. During 1912 Mr. Valentine was chairman of the Board of Public Works of Seattle.

Alexander Jackson Consultant

Former Head of Time-Table Department of New Jersey Road in Business for Himself

Alexander Jackson has resigned as superintendent of time-tables of the Public Service Railway, Newark, N. J., to go into consulting work for himself in constructing time-tables, making traffic studies and laying out of rerouting plans. All his experience has been along lines concerned directly or collaterally with the work in which he proposes now to engage as an independent consultant.

In his own specialty Mr. Jackson has a reputation that is nationwide. In 1919 he won the American Electric Railway Association medal for the best paper presented before a company section. The award was made to him at the meeting of the association in Atlantic City that year. This paper was entitled "Doing Your Bit." It was published in the ELECTRIC RAILWAY JOURNAL for May 31, 1919, page 1049, under the title "Plain Words on Transportation Service." Several years later Mr. Jackson presented a paper before the Canadian Electric Railway Association that attracted a great deal of attention. This contribution was made to the proceedings of that association in June, 1923. The paper was entitled "A Traffic Survey for Interurban Companies." In it Mr. Jackson outlined his methods of making traffic surveys for time-table study.

Alexander Jackson

Mr. Jackson began his railway career as a conductor in Brooklyn. His first employment was with the Brooklyn Rapid Transit Company, then the Brooklyn Heights Railroad, in 1895. Soon thereafter he was promoted to be an inspector and later began the development of his specialty, when in 1897 he was transferred to the time-table department. He continued in time-table work in Brooklyn until he became chief of this department. In 1903 he resigned from the Brooklyn Rapid Transit Company and went to New Jersey with the Public Service Railway, operating 900 miles of road, to take charge of and standardize time-tables of that company, then recently formed as one of the subsidiaries of the Public Service Corporation of New Jersey. In 1906 Mr. Jackson returned to the B.R.T. as chief inspector of surface lines. There he remained until 1908, when he resigned to return to the Public Service Railway as superintendent of time-tables. If Mr. Jackson had stayed in the business until May of this year he would have celebrated his 30th anniversary of service in street railway work.

He has long been active in the work of the American Electric Railway Transportation and Traffic Association, and in 1905 was chairman of the committee on time-tables and schedules of that body.

United Officials Promoted

Officers of Tri-City Group Advanced to Greater Responsibility Following Expansion of Parent Company

Four officials of the United Light & Power Company, Grand Rapids, Mich., which has taken over important properties in Columbus, Kansas City, Kan., and Lincoln, Neb., have been promoted to positions of greater responsibility. Each of the men has been in an executive position with the United Light for some time past.

R. B. McDonald, general manager of the Peoples Power Company, which operates in the cities of Davenport, Moline and Rock Island, becomes president of the tri-city group of subsidiary companies, a position heretofore held by B. J. Denman. He also becomes first vice-president of the Tri-City Railway & Light Company. He remains in charge of the central station but in addition will have direction over the $2,000,000 steam generating central station which the United Light is completing east of Davenport. Mr. McDonald has risen to this position from a storeroom helper.

HELD MANY IMPORTANT POSTS

In 1899 he secured his first position, clerk in the store room of the public utility company at Lincoln, Neb. Not a college man, but with a natural aptitude for mechanics and electricity, the young man worked up to a position of electrician in the power house at Lincoln.

In 1906, when Frank T. Hulswit, builder and president of the future United Light chain, was looking for a man as superintendent of the Fort Dodge, Iowa, power house, he installed Mr. McDonald in that position. Mr. McDonald was made general manager of the plant in a few years.

He grew in experience and judgment as the corporation expanded and was sent by Mr. Hulswit to the tri-cities in 1917 to take charge of the power plant at Moline, Ill., where he became general manager of the Peoples Power Company.

C. N. Chubb, formerly general manager of the Peoples Light Company, the gas and electric company of Davenport, will become divisional chief of the Iowa and Nebraska properties with the title of vice-president of the United Light corporation.

H. E. Littig, promoted to be general manager of the Peoples Light Company, Davenport, has risen from the ranks. Thirty-one years ago he joined the Davenport utility as a conductor and was advanced first to the position of cashier of the Tri-City Railway, then to bookkeeper and rapidly along the line until in 1918 he assumed the rôle of secretary of all the tri-city properties. He continues these duties for the present.

Mr. Weeks a Vice-President

H. E. Weeks, treasurer of the tri-city group and general manager of the securities division of the United Light in charge of customer-ownership and employee-ownership stock, becomes a vice-president of the United Light & Power group with his authority in this department extended to the Nebraska division. Following legislative work in Illinois Mr. Weeks was made secretary of the public utility companies of Alton, Ill. He served in this capacity until 1906, when he was induced by Mr. Hulswit to go with the newly organized United Light Corporation as secretary and treasurer of the tri-city group and vice-president of the Tri-City Railway & Light Company.

Walter Jerome, secretary to L. S. Storrs when he was president of the Connecticut Company, New Haven, Conn., has moved to New York to continue as secretary to Mr. Storrs in his new capacity as managing director of the American Electric Railway Association. Mr. Jerome has worked with Mr. Storrs a number of years.

Howell Ellis, for five years Statehouse reporter for the Indianapolis *Star*, has been named secretary of the Public Service Commission to succeed L. C. Laughry, who is to enter law practice. Mr. Ellis assumed his new position April 1. He is a graduate of De Pauw University, with a master of arts degree.

William Cloutman of the legal staff of the New York Transit Commission has been appointed to have charge of the legal matters relating to the receivership of the New York & Queens County Railway, Long Island City, N. Y., that have been looked after by Gen. L. C. Andrews. H. Pushae Williams, who was appointed by Justice Van Siclen, will continue as counsel for General Andrews, the receiver.

Obituary

J. H. Van Brunt

J. H. Van Brunt, formerly vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., died recently at his home in Kansas City. Mr. Van Brunt resigned from the St. Joseph property in 1920 after 31 years of continuous service. He began his business career with the banking house of R. B. Newcombe & Company, New York, in 1885. Four years later, when Newcombe & Company and other interests purchased the St. Joseph property, Mr. Van Brunt was sent to St. Joseph to take charge of accounts. He was identified with the St. Joseph company in different capacities since that time and up to 1920. In 1902 he was elected vice-president and general manager. At the close of the World War he resigned to engage in business on his own account in Kansas City. In 1918 he was elected president of the Missouri Association of Public Utilities. In recent years he has been operating a radio distributing concern in Kansas City. Mr. Van Brunt was born in Redbank, N. J., in 1868.

V. S. Curtis

Victor Stuart Curtis, secretary and general traffic agent of the Connecticut Company, New Haven, Conn., died at the Bridgeport Hospital on April 6. Mr. Curtis entered the service of the Connecticut Company on Oct. 14, 1914, as secretary. In addition to his duties as secretary on Aug. 1, 1916, he was appointed general traffic agent.

Mr. Curtis was born in Stratford in 1872. He attended the Bridgeport High School and following his graduation joined his father in the express business, later becoming manager of the Bridgeport office of the Adams Express Company. In 1904 he became manager of the Adams Express Company in that city. When the American Railway Express Company took over the express business Mr. Curtis joined the New Haven Railroad official force. Two years later he went to the Connecticut Company.

Mr. Curtis was widely known among electric railway men, particularly in New England.

E. J. Bagnall

E. J. Bagnall died on March 16 in Cleveland, Ohio, at the age of 67 years. He was one of the pioneers in the electric railroad and electric light industries. Mr. Bagnall was connected with the Brush Electric Company, Cleveland, prior to 1880 and shortly afterward formed the firm of Bagnall & Dutton, which took over, managed and operated the Brush electric light station in St. Louis, the first electric light station in that city. He changed this plant from a failure to a success.

Later he was associated with the street railways at St. Louis, tested and disapproved the storage battery system, installed and tested the Short system of railways and then installed a section of the present system on Finney Avenue, the first permanent electric railway in St. Louis, now part of the United Railways. He also designed and built the first electric railway power house in St. Louis. For this work he was obliged to develop many important appliances for the station, the line equipment and motor control.

After completing this work he returned to Cleveland and organized the Adams Bagnall Electric Company, which developed the A-B arc lamp, recognized as in a class by itself until all arc lamps were superseded by the tungsten lamp.

James Collins Jones, general counsel for Day & Zimmermann, Philadelphia, Pa., and managed properties, including the Lewiston & Reedsville Electric Railway, the York Railways, York, Pa., and about twelve other utilities, died on March 14, after a short illness, from double pneumonia.

I. B. Sager, veteran member of the staffs of the East St. Louis & Suburban Railway and the East St. Louis Light & Power Company, East St. Louis, Ill., died on March 20. Mr. Sager was a pioneer in the East St. Louis territory. He built the city's first light and power plant back in 1889. His plant was on the Mississippi River front and was intended primarily to furnish current to freight depots and railroad offices along the levee. When the East St. Louis & Suburban interests bought his power plant Mr. Sager joined that organization and remained a member of the staff up to the time of his death. He was 68 years old.

Major Fred Coutts, long identified with the British tramways, died on March 10. For nearly 20 years he was engineer and manager of the Paisley & District Tramways Company. When the undertaking was bought by the Glasgow Corporation a year or two ago Mr. Coutts was appointed manager of the Dearne Valley Light Railway (Yorkshire). This system was constructed by a combination of local authorities, and was opened for traffic in July of last year. Soon after that Mr. Coutts was appointed general manager of the Yorkshire Electric Tramways and the West Riding Automobile Company.

John Allison Smith, who served the Boston Elevated Railway, Boston, Mass., and its predecessors for 31 years, died on March 14. Mr. Smith was born on Feb. 28, 1868, and entered the service of the West End Street Railway as conductor in 1888, but was obliged to resign on account of serious illness; he returned again as conductor on June 21, 1893. He became starter in 1896, was appointed chief clerk of division nine in 1897 and on Nov. 1, 1907, he was made superintendent of division nine. On Nov. 1, 1919, he was appointed assistant to the superintendent of transportation and on July 1, 1924, was assigned as assistant to the supervisor of time-tables.

Milton Sanford Barger, general treasurer of the New York Central Lines and treasurer of the Ontario Light & Traction Company, the New York & Harlem Railroad and the New York State Railways, Rochester, N. Y., died aboard the steamship *Berengaria* recently while he was en route to Europe on a pleasure trip. After his graduation from Harvard, Mr. Barger followed in the footsteps of his father, Samuel F. Barger, who was a director of the New York Central, and established himself with the same organization. In 1902 he was appointed assistant treasurer of the New York Central & Hudson River Railroad, and was made treasurer of the Harlem Road four years later, and treasurer of the Central Lines West of Buffalo, in 1912. During the federal control period Mr. Barger was treasurer of all Central Lines. He was born in New York City on Feb. 24, 1875. Dutch and Huguenot ancestors of his settled in New York early in the seventeenth century.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Final Road Tests of Gas-Electric Bus

Details of Chassis Design for Mounting Electrical Drive Units Include a Number of Ingenious Innovations—Fuel Consumption Lower than on Mechanical Driven Unit

FINAL road tests on the first of the 200 gas-electric buses ordered by the Philadelphia Rural Transit Company from the Yellow Coach Manufacturing Company have been completed at the manufacturer's plant in Chicago. These tests have been exhaustive and are said to have demonstrated several advantages of this type of construction from the standpoint of quietness, simplicity of control, smooth acceleration and fuel economy resulting from a more nearly uniform engine speed than is obtained in a mechanical drive vehicle.

The general features of the new design were described in the Dec. 13, 1924, issue of ELECTRIC RAILWAY JOURNAL and in an article by J. A. Queeney of the Philadelphia Rural Transit Company outlining some of the considerations which led up to the adoption of the gas-electric unit published in the Jan. 24, 1925, issue. Additional details are now available as the result of the manufacturer's final road tests and the completion of the design of chassis and body.

The drive from the six-cylinder, 4¼-in. x 5½-in. sleeve valve engine, developing 108 hp. at 2,200 r.p.m., to the 25-kw. generator is by a propeller shaft extending through the hollow generator armature shaft. Thus the generator is driven from the rear end of its shaft through a new type of rubber ball universal joint. A similar type of universal is used at the front end of the propeller shaft. The armature shaft is carried on ball bearings. This type of drive was developed to permit torsional flexure, thus relieving the generator of engine torque impulses. In comparison with a close coupled connection between the engine and generator, this arrangement is expected to prevent excessive wear and stress on the rear crank shaft bearing on the engine, which might result from lack of alignment between the two units.

CHANGES IN CHASSIS DESIGN

Application of the electric drive to the Yellow Coach type "Z" chassis necessitated many changes, amounting to practically a new vehicle. This included slight modifications of the steering gear, a complete new frame and various changes to the rear axle. No changes were required in the radiator, engine or front axle.

With a 900-lb. generator mounted just back of the engine a cross-member at this point in the frame to which the unit could be attached was required. This cross-member is of the Yellow Coach standard tubular type. Two lugs on the tube support the generator at its forward end, and a drop-forged openwork girder supports the rear of the generator in a single bearing. This gives three-point suspension and allows the generator to be removed from the chassis by lowering it.

Similar mountings are used for the two motors. A tubular cross-member provides a support for a lug at the forward end of each motor, while a channel sill furnishes a two-point fastening for each motor at the rear. They may be lowered out of the chassis by disconnecting the driveshaft and removing three bolts on each motor.

In the rear axle the differential is eliminated and a dual worm drive is used. The housing is a one-piece double banjo type drop forging. The gear reduction is 11:1. The semi-floating driveshafts have a maximum diameter of 4 in. Dual brake equipment, similar to that used on the standard "Z" chassis, is used. Both brakes operate directly on the rear wheels. The shoes are 5 in. wide, while the drum diameter is 21 in., giving a brake surface area of 659 sq.in.

The long wheelbase of 230 in. required modification of the steering mechanism to reduce the turning radius. The chassis channels are 4 in. x 10 in. section. A height of 20 in. above the ground is obtained by dropping the frame just back of the engine and giving it a kick-up over the rear axle. The frame side members are extended beyond the rear axle a sufficient distance to carry the rear platform on a double-deck bus. This gives a continuous frame length of 30 ft. The chassis is a self-contained unit in so far as the power, control and wiring are concerned. The controller is mounted on the outside of the frame to the left of the driver's seat and the motion from the control handle to the drum is transmitted through bevel gears. The control lever quadrant is in the floor board. This has four positions, namely, forward, neutral, braking and reverse. The importance of maximum accessibility and ease of dismantling has been particularly borne in mind throughout the design. All wiring is inclosed in flexible metal conduit and is fastened to the chassis by insulated cleats. Connections at the motors and generator are made by flat terminal joints.

For both single and double deck bodies the same type of chassis is used. The double-deck design seats 67 passengers, 39 on the upper deck and 28 on the lower. The rear end is entirely inclosed, while the upper deck is semi-inclosed. There is also a forward entrance door to the lower deck, so that by keeping the rear door closed the bus may be operated by one man. A folding door inside the rear vestibule shuts off the staircase to the upper deck. Doors are arranged to close air-tight with molded rubber on the edges, which fit into specially designed channels at the posts. They are supported on ball-bearing mounted shafts. The upper deck floor is a self-supported member of ⅝-in. Haskelite, reinforced at the aisle by three ½-in. boards. Diagonal floor strips cover the upper deck floor with the exception of the aisle, where the strips run lengthwise. The upper deck roof is similar to the type used in Detroit and Chicago.

Lower deck seats are upholstered in leather. Interior finish of both upper and lower decks is mahogany.

Illumination on both decks is provided from a specially constructed 550-watt generator. Brass sash are used both above and below and are arranged to lower into side pockets.

Single-deck bodies seat 33 passengers on leather upholstered cross seats. On both double and single deck bodies the floor over the generator and brake adjusting mechanism is a one-piece aluminum casting ⅜ in. thick. Trapdoors in this allow access to the brake adjusting levers and to the commutator of the generator. By entirely removing this floor plate ample room is provided for disconnecting and lowering the generator. All side posts, letterboards and other exterior woodwork are covered with sheet aluminum.

FUEL ECONOMY INDICATED

The road tests recently completed indicate a fuel consumption below that of a gear-driven bus of the same size and type. Acceleration up to 25 m.p.h. is obtained in 25 seconds, making an average rate of 1 m.p.h. per second. At lower speed the acceleration is still better. Ten miles per hour is obtained in five seconds, or at the rate of 2 m.p.h. per second. These figures were obtained from tests on a loaded chassis, the total load being 20,000 lb., which is considerably in excess of a fully loaded single-deck bus.

At idling speeds of the engine, that is, below 400 r.p.m., the voltage generated is so low that only a negligible flow of current takes place through the motor. It is therefore possible to have the generators and motors connected at all times. Under this condition the controller handle is in the forward position. As a safety measure a neutral position is provided in the controller to open the electrical connections.

With the controller in the forward position the bus is started and accelerated simply by opening the engine throttle. Due to the differential winding of the generator, the electrical characteristics are such that as the load required by the motors decreases as balancing speed is approached, the voltage rises. This increased voltage, combined with the decreased torque requirement, still further increases the speed of the motors. Since the rate of acceleration of the bus is predetermined, regardless of how suddenly the throttle is opened, the engine cannot be stalled during the operation of acceleration.

Cars Damaged in Fire in Bronx

Forty-nine cars were partially burned in a fire at the West Farms carhouse of the Union Railway at 174th Street and Southern Boulevard in New York City on April 6. The damage to the equipment and building is estimated at $200,000. The cars will be rebuilt.

Fortunately the fire was confined to a strip of the roof which burned straight through the center of the building. The walls and the floor are intact. The carhouse will be rebuilt for temporary use.

The employees of the company handled the fire most creditably. At its start they attacked the blaze with chemical extinguishers and small hose lines, and although four alarms were sounded and most of the fire apparatus in the Bronx responded for service, the early work of the railway's own men in combating the blaze is credited by company officials with helping materially to keep the fire from getting beyond control.

Tests Made of Catenary Material at Erie

During the past several months the Anaconda Copper Mining Company, New York, N. Y.; the American Steel & Wire Company, Chicago, Ill.; the Aluminum Company of America, Pittsburgh, Pa., and the Copperweld Steel Company of New York, N. Y., erected at Erie, on the right-of-way of the East Erie Commercial Railroad, four distinctly different kinds of catenary material for an exhibition and test held on April. 9. The General Electric Company furnished the facilities and equipment. Three companies put up two spans each and the Aluminum company four spans. The different types of material used included hard drawn copper and phono-electric. In the case of the Aluminum company the catenary supporting wire was steel cored aluminum. All of the fittings and the lacing wire were of aluminum. The tests included collection of heavy current, and were made under actual working conditions. Elaborate precautions were taken to insure data on each installation without any influence from the adjoining spans. The installation will be permitted to remain in place over the tracks to determine the relative deterioration.

Westinghouse Merchandising Department Moves to Mansfield

All activities of the merchandising division of the Westinghouse Electric & Manufacturing Company will hereafter be directed from Mansfield, Ohio. J. S. Tritle, manager of the merchandising department of the company, will become general manager of this department. Mr. Tritle has moved his headquarters, with his entire staff, from New York to Mansfield. The majority of the articles comprised in the merchandising department are produced at the Mansfield works.

Heretofore the engineering and manufacturing operations have been supervised by officers at East Pittsburgh, while the sales activities have been directed from the merchandising headquarters in New York. All engineering work will now be conducted in Mansfield under the supervision of Mr. Tritle. Those engineers at East Pittsburgh who have been engaged on the products made in Mansfield will be moved to the Ohio plant. It has been recognized for a long time that such a change was desirable in order to obtain unified effort in the conduct of the business.

Growing Demand for High Grade Mica

For a large part of its supply of mica industry in the United States is essentially dependent upon foreign sources. Both for quality and quantity of its product India easily ranks first among the world's producers of mica. The best Indian muscovite mica is red in color and for this reason is known as ruby mica. This mica is unsurpassed anywhere for its ability to withstand high electrical pressure.

The importance of mica to the industrial world lies principally in two properties—it divides naturally into thin even sheets of considerable strength and flexibility and it is not only an excellent electrical insulator but makes such insulation safe by offering great resistance to heat. Whereas total world production of mica in 1890 was valued at only $250,000, the value of this mineral handled in the markets of the United States alone in 1923 was more than $2,800,000. Imports of mica into the United States in 1923 both in quantity and value were nearly four times the average of the five years immediately preceding the outbreak of the war in Europe. According to the National Bank of Commerce, New York, total mica imports into the United States in 1924 were somewhat less than those of 1923, but the amounts were still large. The United States has recently been taking about half the exports from British India, or from three to four times its average pre-war takings in that market, and is at the same time importing about 340,000 lb. of mica yearly through Great Britain, most of which is probably Indian mica. Next to those of India, the deposits of Canada offer the most important foreign source of the mica consumed by the electrical industries of the United States.

The growing demand for mica of the better grades has given rise to increased interest in sources of supply hitherto little used. A large part of this interest has been devoted to the mica fields of Africa, where it has been found possible to obtain considerable quantities of high-quality mica at an advantageous cost level.

The mining of mica is to a large extent a highly speculative industry and is surrounded by greater economic hazard than obtains in almost any other mining operation. The occurrence of this mineral is most irregular and there are no rules to guide the prospector.

During the war production of mica was stimulated in South America and although the output fell off sharply with the end of the wartime demand there is still a considerable quantity of high grade sheet mica available from this source.

Studebaker to Build Buses

A. R. Erskine, president of the Studebaker Corporation, at the annual meeting on April 7, said that more than 1,000 Studebaker big six chassis carrying special bus bodies are in daily operation on bus lines in all parts of the country. According to him the Studebaker engine has been found to be particularly suitable for these demands and the company is planning to put into production a specially designed long wheel base chassis for bus work.

March sales were 14,923 cars against 12,398 last year. Sales in the first quarter were larger than for the corresponding period last year. Mr. Erskine said that production in the second quarter would be 40,000 cars, and that export sales have shown from 50 to 100 per cent increase each month since last September.

Paul G. Hoffman and F. W. Longfellow were elected directors to fill vacancies. Mr. Longfellow succeeds the late Frederick P. Delafield. Mr. Hoffman also was made a member of the executive and finance committees, as well as vice-president in charge of sales.

Heater Company Wins

According to the final decree of the United States District Court, the St. Louis Pneumatic Devices Company is enjoined from manufacturing or selling apparatus covered by the patents of the Consolidated Car Heating Company. The decision to this effect was handed down by Judge C. B. Faris of the Eastern Judicial District of Missouri on March 27. The court found that the defendant, J. M. Dapron, doing business under the name of the St. Louis Pneumatic Devices Company, had infringed upon the patent granted to J. M. McElrow, later sold to the Consolidated Car Heating Company. It was further ordered by the court, the plaintiff agreeing, that no damages should be paid by the defendant.

Manufacturer Co-operation

An example of co-operation between the manufacturer and the electric railways was shown on a card inclosed with dividends of the Ohio Brass Company, Mansfield, Ohio. The card read:

> Whenever you pick up, in your automobile, a person waiting for a street car, you incur a legal liability and reduce the revenue of an electric railway—one of our customers who helped make this dividend possible.

Metal, Coal and Material Prices

Metals—New York	April 7, 1925
Copper, electrolytic, cents per lb.	13.587
Copper wire base, cents per lb.	15.75
Lead, cents per lb.	8.15
Zinc, cents per lb.	7.48
Tin, Straits, cents per lb.	51.125
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.65
Weatherproof wire base, N.Y., cents per lb.	18.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.12[illegible]
Turpentine (bbl. lots), N. Y., per gal.	0.98

Rolling Stock

Toronto Transportation Commission, Toronto, Canada, is now rebuilding the 160 remaining pay-enter cars taken over some time ago from the Toronto Railway. These are being converted into front-entrance, pay-leave cars. When the change has been completed all motor cars will be front entrance. Trailers for these trains will be of the same type as those used in Montreal with the exception that they will be equipped with automatic rear exit doors.

Gary Street Railway, Gary, Ind., recently ordered five new single-truck safety cars. The specifications follow:

Date order was placed	Feb. 17, 1925
Date of delivery	April 10, 1925
Builder of car body	McGuire-Cummings Manufacturing Company
Type of car	One-man safety double end
Seating capacity	24
Length over all	30 ft. 2½ in.
Truck wheelbase	8 ft. 0 in.
Width over all	8 ft. 0 in.
Height, rail to trolley base	10 ft. 2⅞ in.
Body	Semi-steel
Interior trim	Mahogany
Roof	Arch
Air brakes	General Electric Company
Axles	3 in.
Car signal system	Electric
Car trimmings	Bronze
Couplers	1¼-in. round draw bar
Curtain fixtures	Rexall metal rollers
Curtain material	Pantasote K-2 color No. 86
Destination signs	Illuminated
Door-operating mechanism	Pneumatic
Fenders	HB lifeguards
Heaters	Twelve truss plank
Headlights	Incandescent with dimmers
Journal boxes	3-in. x 6-in. MCB
Motors, type and number	Two GE-258
Enamel	Old Dutch
Registers	Ohmer
Seats	Five wood cross-seats on each side
Springs	Quarter elliptic hung on coils
Trolley base	Ohio Brass Company
Trucks	McGuire-Cummings No. 90
Wheels	26-in. rolled steel

Southern Public Utilities Company, Charlotte, N. C., has ordered six double-truck one-man cars for use in Greenville, S. C. The new equipment will be larger than the present one-man cars.

San Francisco Municipal Railway, San Francisco, Cal., has not yet decided on the plans for the fifteen new cars it has in mind to purchase. The new cars are badly needed, but the supervisors have not yet found time to act upon the question of their design. It is thought that the cars will be of a type similar to those on the Geary Street line. These are semi-steel, each with a seating capacity of 50.

Springfield & Xenia Railway, Springfield, Ohio, has ordered three new combination passenger and smoking interurban cars from the St. Louis Car Company.

Seattle Municipal Railway, Seattle, Wash., will purchase two new buses for use on Empire Way. An appropriation of $12,000 was authorized for this equipment.

Southern New York Railway, Inc., Oneonta, N. Y., suffered the loss by fire of eight cars and all the machine shop tools. The damage, partially covered by insurance, is estimated at upward of $100,000.

British Columbia Electric Railway, Vancouver, B. C., is reported to have placed an order with a British firm for eight underslung buses to be constructed in England and shipped to Canada for assembly.

United Railways & Electric Company, Baltimore, Md., through its subsidiary, the Baltimore Transit Company, purchased five additional buses since the recent acquisition of the East Fayette Street Bus Company. It is expected that six more will be bought.

Hot Springs Street Railway, Hot Springs, Ark., has purchased two new Reo motor coaches of the latest model 21-passenger type. The coaches will be delivered April 20.

Evansville & Ohio Valley Railway, Evansville, Ind., has ordered five combination interurban cars from the American Car Company, St. Louis.

Gary & Hobart Traction Company, Hobart, Ind., recently placed an order with the G. C. Kuhlman Car Company for three light-weight interurban cars each with a seating capacity of 44.

Kansas City Railways, Kansas City, Mo., has estimated that it will have to purchase 63 buses in order to meet the terms of the new bus franchise granted to it on April 7. Both single and double deck buses will be required.

Illinois Power Company, Springfield, Ill., has placed an order for three 25-passenger Mack city-type buses.

Track and Line

Montreal Tramways, Montreal, Que., includes the construction or reconstruction of 54 miles of tracks in the 1925 program now before the city, the company and the Tramway Commission's engineers. At least 30 miles of track will be laid during the 1925 season.

Eastern Massachusetts Street Railway, Boston, Mass., has received bids for the reconstruction of 5,600 ft. of railway track on Hancock Street in Quincy, Mass.

Southern Public Utilities Company, Charlotte, N. C., will re-lay the curve of the track from North Main Street into College Street in Greenville, S. C.

Power Houses, Shops and Buildings

Toronto Transportation Commission, Toronto, Canada, has begun excavation for a two-story garage to be built on its Hillcrest property. It is planned to provide facilities now for the accommodation of 90 buses. Ultimately these quarters are to be extended to take care of 200 buses.

Portland Electric Power Company, Portland, Ore., has begun construction of a two-story brick and concrete addition to the Jefferson Street substation. The building, including the installation of electrical machinery and equipment, will cost between $90,000 and $100,000. Ground was broken in March and it is expected to have the structure completed in 90 days. The project became necessary because of a rapid demand for both direct and alternating current service on the west side, this substation being the tie-in plant between the east and west side power supply. This service includes the 600-volt direct current for operating the railway department on the west side.

Trade Notes

National Paving Brick Manufacturers Association, Cleveland, Ohio, through its board of governors, elected officers at its regular quarterly meeting on March 17 at Cleveland. W. P. Whitney, president of the Springfield Paving Brick Company, Springfield, Ill., was elected president of the association for the ensuing year. Other officers of the association were re-elected.

Electric Service Supplies Company, Philadelphia, Pa., has increased its sales force to include J. H. Spraggon, who for twelve years has been connected with the Westinghouse Electric & Manufacturing Company in various capacities. For the last six years Mr. Spraggon has been selling in the New England territory for the Westinghouse company.

Standard Scale & Supply Corporation, Pittsburgh, Pa., has announced that R. H. Chappel was recently elected treasurer and general manager. This corporation is entirely new and separate from the old Standard Scale & Supply Company of Beaver Falls, which is out of existence. It manufactures railroad track and truck scales, the narrow drum concrete mixer and handles contractors' equipment in general. Branch offices, warehouses and stores are located in Pittsburgh, New York, Philadelphia, Chicago and Cleveland.

W. N. Matthews Corporation, St. Louis, Mo., elected directors at the annual meeting of the stockholders on March 3. They are W. N. Matthews, Claude L. Matthews, James R. Kearney, M. C. Cooley and C. C. Fredericks. At the annual meeting of the board of directors, held on March 11, the following officers were elected: W. N. Matthews, president; Claude L. Matthews, vice-president and treasurer; James R. Kearney, vice-president and manager electrical sales, and M. C. Cooley, secretary. C. C. Fredericks, formerly vice-president and general manager, has left its employ. The company announces that its affairs were never in better condition and it looks forward to a good business for the balance of the year.

General Electric Company, Schenectady, New York, through the Edison Lamp Works of Harrison, has issued a 50-page bulletin entitled Adequate and Efficient Motor Bus Lighting. The booklet, which is illustrated, gives some facts on the evolution of the motor bus and includes a summary of lighting conditions as found in buses during 1923.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has announced that as W. G. Willcoxson is no longer connected with the company, it will be temporarily represented in Chicago territory by F. O. Bailey, manager of sales, and A. D. Stuver.

Six Wheel Company, Philadelphia, Pa., manufacturer of the Safeway six-wheel motor coach, has announced the appointment of C. Eustace Dwyer as general sales manager and A. P. Warner as assistant general sales manager.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, April 18, 1925 *Number* 16

Repair Equipment Parts Before Excessive Wear Occurs

IN DISCUSSING maintenance methods at a recent association meeting one speaker showed that maintenance costs are often increased by keeping parts in service when they should be repaired. By removing parts in time they can be reconditioned, while if allowed to remain in service too long they destroy themselves and an entire replacement is necessary. Wear resulting from looseness has been found to increase very rapidly with the amount of movement so that the more parts have become worn the faster is the subsequent wear.

With the present extended use of welding for building up worn surfaces and the well-known economies of such methods there is little excuse for allowing parts to become excessively worn. Equipment parts are now considered as scrap only when they have reached such a condition that it is no longer economical to reclaim them by welding.

All departments of the railway can economize through such reclamation of worn parts. Perhaps the largest field of usefulness is in connection with rolling stock maintenance. Many companies have determined definitely that they obtain large reductions in equipment defects and troubles through their ability to keep parts tight by welding and remachining. Loose bearings in housings and motor frames and loose outside fits for housings have caused many bearing troubles. There is no longer an excuse for shimming up such parts in order to secure a temporary tight fit which soon loosens and results in increased trouble. One armature damaged so that rewinding becomes necessary will cost as much as the welding and remachining of many housings and bearings.

In making all repairs one important point is to make them before excessive wear has occurred. By doing so repair costs are cut and the best reclamation results.

Blaming the Other Fellow Will Not Eliminate Noise

REDUCING as much as possible the noise of car operation is now widely recognized by electric railway men as highly desirable. A certain tendency exists, however, to transform this commendable effort to improve transportation service into an excuse for backhanded criticism of those responsible for existing conditions. The way engineer is inclined to argue that the real trouble is that the rolling stock is not properly maintained. On the other hand the master mechanic is likely to believe that the trouble is with the track.

So long as activity in the direction of reducing noise is limited to the pot calling the kettle black, little progress will be made. Neither track department nor mechanical department is wholly to blame, nor is either one altogether blameless. In reality the noise may result in part from defects in track, in part from defects in cars, and also from certain features in the original design of roadway and rolling stock.

Too much adverse criticism should not be directed at those responsible for designs made a number of years ago, for the subject of noise reduction was not generally considered of much importance until recently. To improve matters now plenty of opportunities are available for use by both mechanical and track departments. Let each do what it can within its own field. Special attention to methods of eliminating noise is being given by both the equipment and way committees of the American Electric Railway Engineering Association. Their reports undoubtedly will be helpful in pointing out ways to attain this end.

Waste Elimination in Industry a Matter of National Importance

MUCH good should come from the conference held by the National Civic Federation last week, and which is reported elsewhere in this issue. Waste elimination and the minimizing of industrial controversy, the subjects discussed by Herbert Hoover, Gerard Swope and William Green, reach down to the essentials of all modern industry. As Mr. Hoover clearly pointed out, the elimination of industrial wastes provides the greatest opportunity for an increase in wages and higher standards of living for the worker. Looking at it directly from the viewpoint of the electric railway industry, greater efficiency means an increased production per man employed. This in turn means reduced operating expenses, higher wages, or both.

One of the places where the greatest gain in man-efficiency can be made is in the electric railway shop. With the wide range of operations in car repair work it is not surprising that there is a large waste of labor. It is not, however, impossible to reduce this form of waste greatly. Standardized methods, organization of repairs so that the same operation can be performed many times in succession, either by allowing a certain job to accumulate or by the production of a number of like parts in advance of the need for them, correct shop layout and efficient routing of work, are all ways in which an increase of output may be obtained.

Another phase of waste elimination that was discussed at the conference is reduction of idle time due to industrial disputes. There have been many such in the street and electric railway industry in its 40 years of existence. Deplorable as such clashes are in general, they are even worse in the electric railway industry, for they deprive the men of their wages, the public of needed service and the company of needed revenue. Unlike many manufacturing businesses, such losses can never be made up. Particularly at this time, when the United States Supreme Court has just decided that con-

This is the issue in April that is devoted essentially to maintenance subjects

trol of labor such as was contemplated by the Kansas Industrial Court is unconstitutional, any action looking toward greater stabilization of labor is to the advantage of all parties.

Conformity to Existing Details Should Be Considered in Design

ADVANTAGES of new equipment, great as they are, could often be enhanced by considering the matter of conformity in certain details, with existing designs. A criticism frequently heard, is concerning the lack of interchangeability of parts with equipment now in service. A recent order for car equipment specified a type of motor brought out fifteen years ago. Inquiry as to the reason for this choice developed the fact that this railway had but one type of motor, although it was operating 500 motor cars. Officials of this road considered the advantages of uniformity as outweighing the advantages of improved design.

Larger parts of railway motors, such as frames and housings, are seldom replaced, and interchangeability with existing equipment is of no particular advantage. But repair parts such as armature coils, commutators, brushes, brush-holders, field coils, bearings, gears and pinions must be kept on hand in considerable quantities for replacement. Any reduction in the number of types that have to be carried in stock is a great help. Several railways have rehabilitated their motors with a view to reducing the number of types of bearing. Others have made wholesale changes in gear ratio so as to provide uniform gearing. These small things might have been taken care of in the original design without decreasing the number of valuable new features, had the matter been studied in that light.

A number of things that may be considered as auxiliaries to the motors are affected by the design. Among them are motor suspensions, connectors for motor leads, lengths of motor leads and the position on the motor where they are brought out. Uniform arrangement of such details by the motor manufacturers would do much to reduce the number of parts carried in stock and also provide a uniformity that will speed up repairs. Along with the desire to have improved equipment there is a feeling among the railway men responsible for maintenance that much can be done with advantage toward securing greater uniformity of small parts.

Municipal Ownership Fails to Attract Votes

ON THE same day proposed local transportation ordinances were recently turned down by overwhelming votes in both Chicago and Milwaukee. The two ordinances were quite different in plan. There was, however, one point of marked similarity—both provided for ultimate ownership of the lines by the cities.

The Chicago ordinance was called municipal ownership because title to the lines was to pass immediately to the city. Operation, however, was to have been in the hands of a board on which both the city and the security holders would have been represented. As pointed out in ELECTRIC RAILWAY JOURNAL for March 7, this board was designed to curtail the political patronage dispensers, at least until such time as the city actually obtained controlling representation on the operating board. This period was variously estimated at from 25 to 40 years.

From the standpoint of the electric railway industry as a whole, the greatest danger in the ordinance offered to Chicago by its Mayor lay in the municipal ownership label. Those enthusiasts who see in municipal ownership of utilities some magical method of changing human nature so that the mixing of local government with business will produce efficiency would have been quick to claim Chicago as a convert to their cause. In Milwaukee, while no stretching of definitions would have justified use of the municipal ownership label, provisions for ultimate municipal acquisition of the lines occupied a prominent place in the plan.

Chicago has generally been considered to contain a strong sentiment for municipal ownership. Even the ordinances, adopted in 1907, under which the Surface Lines operate, contain specific provisions covering municipal purchase of the lines. Milwaukee is a community of strong socialistic sentiment.

Both ordinances were overwhelmingly defeated, even though from the standpoint of the car rider they contained many desirable provisions. The inference from this is obvious. The municipal ownership hobby in these cities at least is apparently joining the remainder of the equine family as an obsolete factor in municipal transportation.

Modern Machine Tool Equipment May Effect Substantial Economies

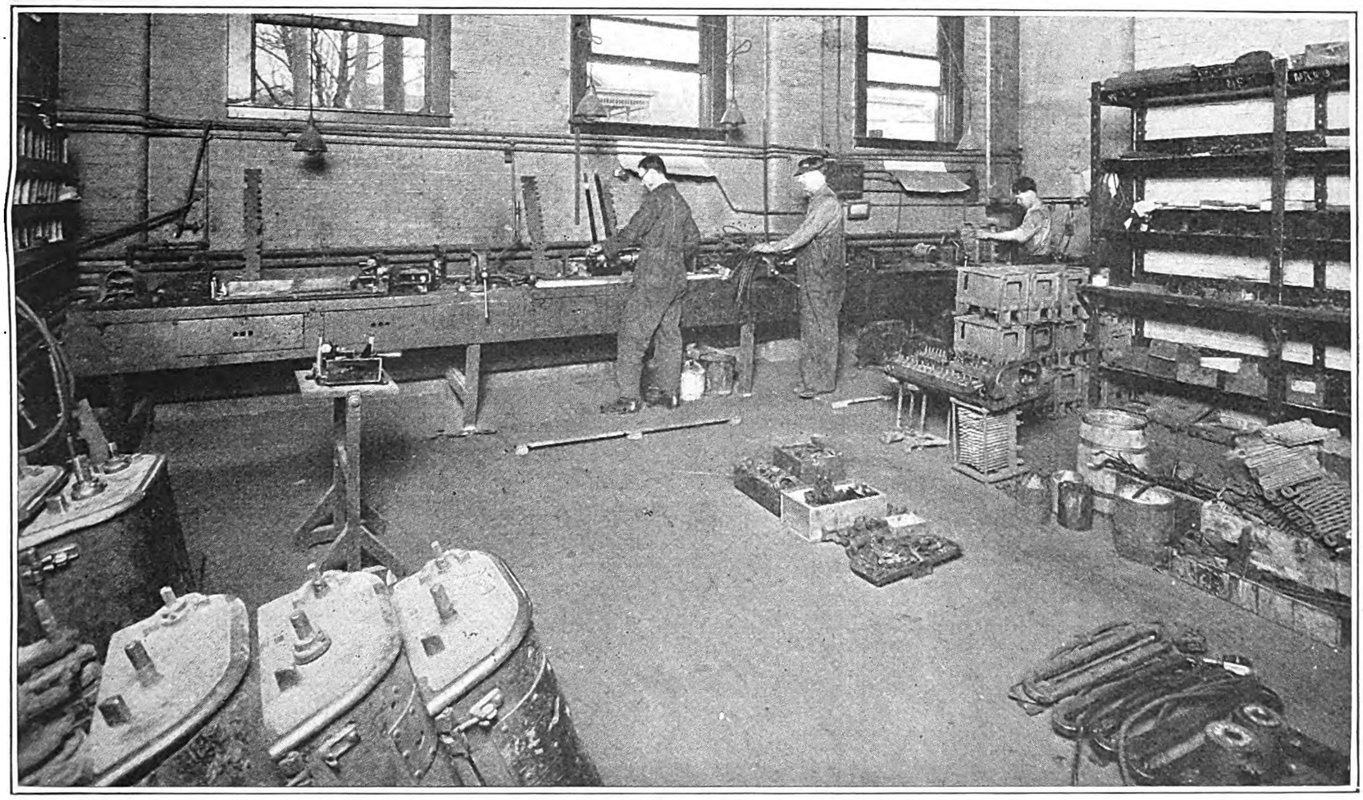
METHODS used to carry out various shop processes depend largely on the machine tool equipment available. For example, many railway shops are without power punches. In such shops, as a result, many operations are performed on drill presses that could be carried out much more quickly and economically were a power punch available. To cite another illustration, pneumatic hammers are not found in railway forge shops to the extent that they should be, and much hard work is necessary. The men directly in charge of maintenance nearly always realize the value of and need for such machine tools. But as new tools must be charged to capital account, many railway executives feel that they cannot finance the added expenditure, failing to see that operating savings would soon equal the first cost.

As a prerequisite to obtaining proper attention from the executive, information is needed to determine the extent of the economies that will result from the use of new machine tools in electric railway maintenance work. Few companies keep detail costs. As most tools are used on a large variety of work and any specific operation is not performed over and over, it is hard to make a concrete estimate of the cost of individual operations.

Many machine tools used by electric railways are also of an old type that should be replaced. A survey made by this paper a year ago showed that 40 per cent of the machine tools used in the industry are more than twenty years old. If master mechanics would list their machine tools which are in this twenty-year classification, and figure the cost of producing on such tools some of the particular jobs that are done most frequently, comparisons of the cost of doing the same work with modern tools could be made. By taking into consideration capital charges on the investment proposed and making allowance for time consumed in necessary idleness an accurate idea of savings would be established. Analysis of these costs should help materially in convincing executives of the need for new equipment, and with such information available it is certain that the purchase of many machine tools would be justified.

Modernizing Platform Controllers

K Type Hand Controllers Are Being Rebuilt by the New York State Railways to Include Late Improvements of Manufacturers—Wiring Is Increased in Size—New Type Contacts and Shunts at Fulcrums of Cut-Out Switches Are Installed —Special Jigs and Fixtures Used in the Work



Controller Overhauling Department at Wolf Street Shops, Syracuse, New York State Railways

RECONSTRUCTION and overhauling of controllers has been systematized for all the various shops of the New York State Railways. A definite program for doing maintenance work on controllers was started two years ago at the Wolf Street shops, Syracuse. About 65 per cent of the controllers for cars maintained at those shops have now been given this extensive rehabilitation.

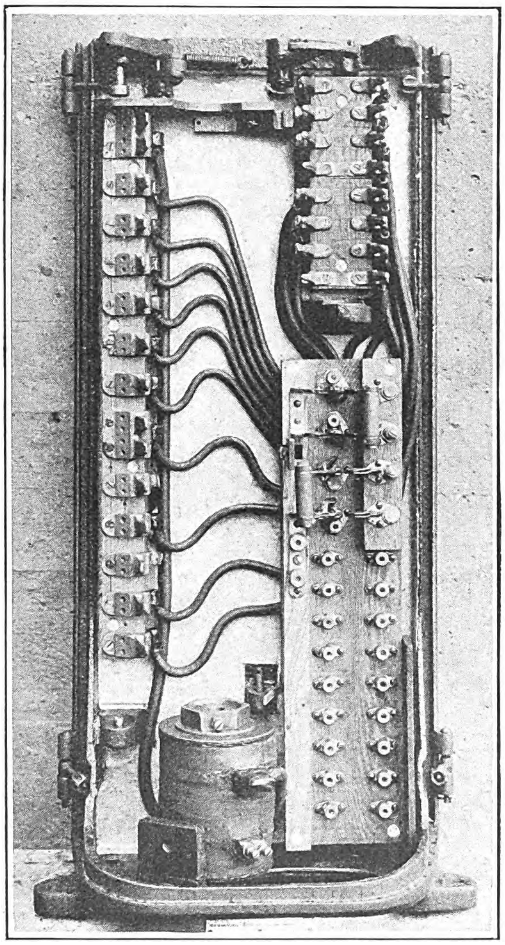
Controllers are removed from cars that come in for general overhauling, and in addition from other cars which are in for repairs as fast as the work can be taken care of in the controller department. The various types of controllers in service on the company's properties include K-6, K-10, K-12, K-28 and K-35. While the work naturally varies with the type all controllers are entirely dismantled. The frame is scraped and cleaned carefully and is lined with asbestos, which is shellacked on so as to hold it firmly. Cover hinges and bolts which have become bent are straightened. Any bolts with stripped or badly worn threads are replaced. The bearings for the drum shafts are brought back to original size either by bushing or by welding and reboring. Pawl fulcrums and rollers are gone over and if worn they are replaced. New springs are installed throughout. Finger bases are removed from the contact blocks and dipped in a bath of sulphuric acid. Wooden contact blocks found in good condition are scraped, cleaned and painted with orange shellac for reuse. Molded types of contact blocks are cleaned of all carbonization. In replacing the finger blocks, holes over heads of screws are plugged with asbestos to overcome danger of short circuits or grounds.

CONTROLLER WIRING STANDARDIZED

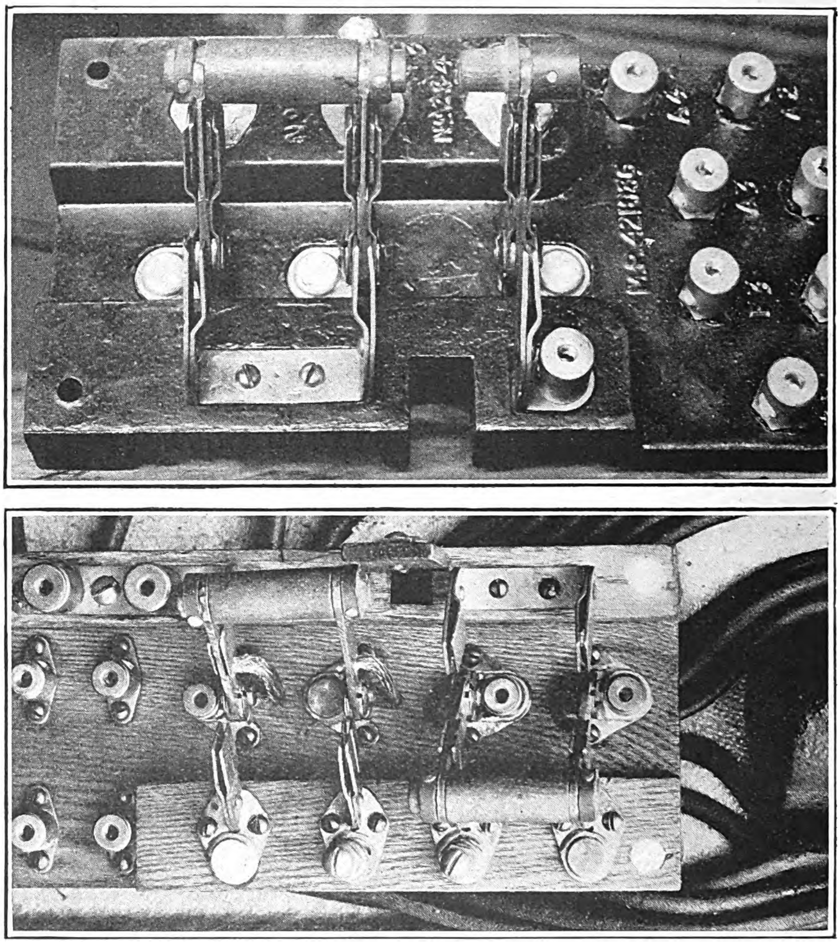
All connections in the controllers are replaced with new stranded, weather-proof insulated cable. For resistor and reverse connections the equivalent of No. 6 wire is used. Leads to finger bases and terminals for main motors are of No. 4 equivalent wire, ground leads are No. 3 and trolley leads No. 2.

On the older types of controllers some trouble has been experienced from overheating of the contacts and fulcrums of cut-out switches. In some cases this heating has been sufficient to melt the solder at terminals, allowing the leads to loosen and cause open circuits. An improved type of contact for these switches, which was developed by the railway for K-28 controllers, is now being furnished by the General Electric Company. This provides double the amount of contact surface that the old clips had and provides increased spring tension on the contacts. Phosphor-bronze spring washers are also used at fulcrum points. These washers keep the springs tight and provide increased contact surface.

A molded type of connection board is being installed in K-28 controllers. Braided shunts are being installed around the fulcrums of K-6 cutout-switch blades and spring washers are also added. The shunts are brazed to the contact blades at one end and to the fulcrum base at the other.



Controller Frame with Finger Blocks and New Wire in Position



At Top, Improved Type of Contacts for Cut-Out Switches. At Bottom, Braided Shunts Installed Around Fulcrums of Cutout Switches

Standard practice of the railway is to use reversible trigger-lock fingers. Weak or burned finger springs are replaced and the contact portion is dressed up so as to make a good contact across the entire width. Arc shields and arc deflectors, if in good condition, are scraped, filed and buffed. Holes and uneven surfaces are repaired with Westinghouse No. 521 arc cement. New arc deflectors replace any that cannot be repaired satisfactorily.

Blow-out coils are removed and tested with a Century testing outfit. If the test shows any turns to be short circuited, the coils are torn down and the entire winding is reinsulated. After the coils are rewound they are again tested with the Century testing outfit.

Rebuilding Controller Drums

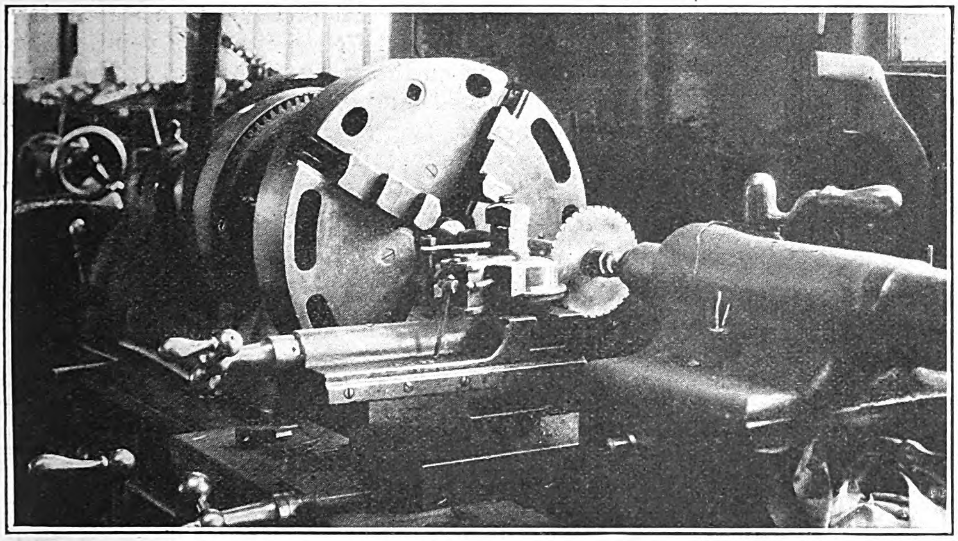
All controller drums are rebuilt. The standard practice of the railway is to use hexagonal shafts with K-6, K-28 and K-35 controllers and a round shaft with one side flat for K-10 and K-12 controllers. The body castings for the drums are cleaned and sand blasted. On K-35 controllers when the circuit is opened the arc formed has a tendency to follow down to the body casting and burn underneath the contact segments. This leaves the front ends of the segments without support. Body castings that have become weakened in this manner are built up by brazing with an acetylene torch and then machined to the proper contour. When reassembled, arc shields are fastened to the front sides of the castings underneath the contact segments in order to protect them from the arc.

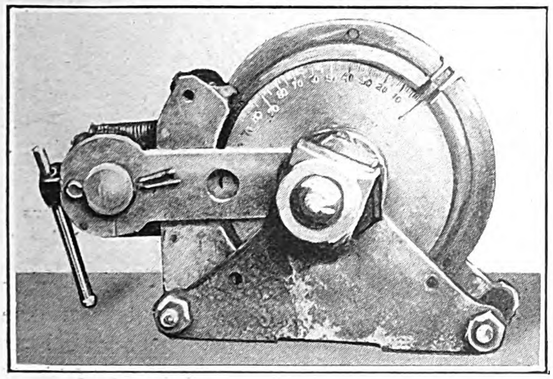
The star wheels on some of the drums have been found to be loose. When this condition exists new pins are inserted and the holes are filled in and redrilled to provide a tight fit. Some star wheels which have rough edges from wear and from pitting due to flashing are ground off.

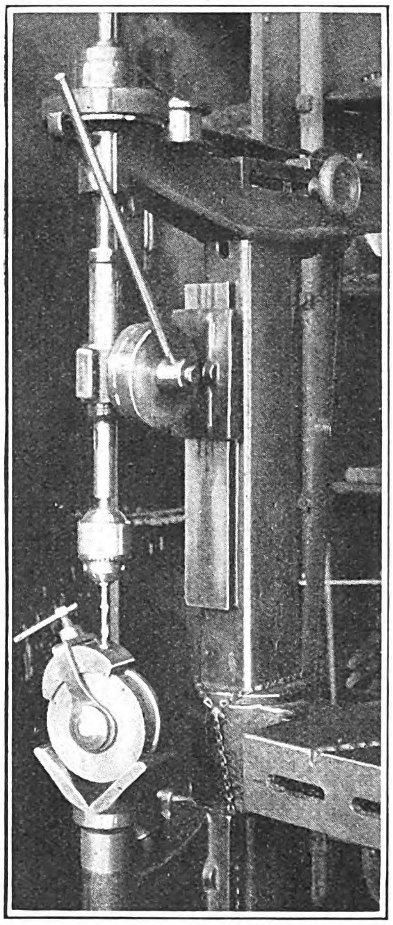
Old contact segments that are not too thin are cut down to make shorter length segments. Some ingenious jigs and fixtures are used in connection with the cutting and redrilling operations. Accompanying illustrations show the jigs as used at the Utica Park shops, which are typical of those used at each of the shops.

The fixture for holding a contact segment while it is being cut consists of a circular center section of the same diameter as the inside of the segment. The upper outside edge of this central portion has a scale of degrees. A sample segment of the type desired is placed around the fixture and the number of degrees spanned by it is read on the scale. This is used as a guide for the segments to be cut off. The old segment to be cut is then clamped in position so that it will cover the required arc. The clamp swings from the central shaft as a fulcrum. A loose piece on the outside is normally held away from the center portion by springs, but when the segment is in place it is tightened with a hand screw so that it fits over the segment and the hand screw holds it firmly in position.

The cutting is done in a lathe, the jig being fastened to the carriage as shown in one of the illustrations. The central arbor of the jig fits into the tool-post slide and is clamped by two nuts on top. A circular saw mounted on an arbor between the lathe centers cuts off the segment to exact length. As the circular part of the fixture with the segment clamped in position is free to rotate about its central shaft, segments can be placed in position rapidly and can be cut to desired lengths without changing the position of the jig on the carriage. In cutting, the segment is fed to the saw by the cross feed of the lathe carriage.







Special Jigs for Cutting and Drilling Contact Segments

Above, Set Up for Cutting Contact Segments.

At Left, Fixture Used to Clamp Segments While They Are Cut.

At Right, Jig for Drilling Controller Contact Segments.

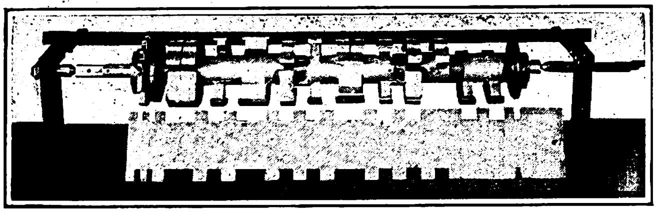
The jig for drilling segments is quite similar to the cutting off fixture, but is arranged for mounting on a drill press. Its cylindrical body has the same outside diameter as the inside of the segments. Two sides are flanged so that the segment to be drilled fits into a groove. The segmental part of the jig with a bushed hole for guiding the drill is separate and fits over the contact segment. A clamping attachment operated with a hand screw pivots about the center of the jig.

To locate the segment for drilling the first hole a sample segment is used. The outside segmental part of the jig with its bushed hole is then put in place and is clamped in position by swinging the clamping arm over the loose part and tightening the hand screw. Radial drilling of the hole is obtained by the use of a V-block rest on the drill press. After the first hole is drilled, it is placed over a stud on the jig so that the second hole will be drilled accurately. The position of the loose part of the jig is fixed by two dowel pins which fit into corresponding holes. The countersinking operation is performed with the same jig, a special countersink being used which bottoms on the jig when the required depth has been reached.

After the contact segments are assembled on the controller drums, vertical position, alignment and rotundity are checked in a special fixture. Its two end brackets have adjustable centers so that the controller drum can be rotated. A straight edge is clamped in position on two brackets in such a position that by rotating the drum any eccentricity of the contacts is apparent at once. In this way the alignment of all the segments which are supposed to make or break electrical contact at the same time can be checked accurately. The vertical spacing of the contacts and the contact width is checked with templates of sheet steel which are placed over the drum at various positions. The same templates check the positions of the end insulation disks and the star wheel. The contact making and breaking positions and adjustment of the fingers to insure proper contact are checked after the drums and fingers are assembled in the controller frames.

The K-12 type of controller in its original form had a central blowout coil with pole piece extending over the contacts. The reverse cylinder occupied a space over the blowout coil with contact fingers on both sides. Controllers of this type are now being reconstructed by the railway so as to use finger blocks with individual blowout coils. The space previously taken by the blowout coil is utilized to provide a longer reverse cylinder with contact fingers on but one side. Eight controllers have already been changed to this form.

Many failures of controllers and other equipment are prevented on the Utica lines by an insulation resistance test made under the supervision of C. J. Jones, foreman



Fixture for Checking Controller Drums After Assembling

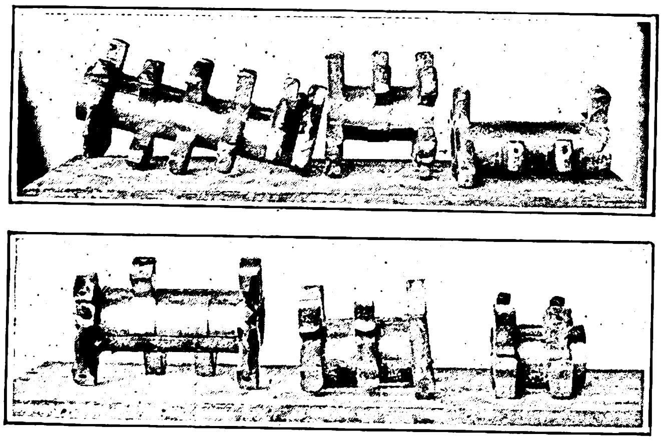
of the electrical department. This test is made with a voltmeter with a 550-volt scale and having an internal resistance of 65,800 ohms. The positive terminal of the voltmeter is connected to the trolley. A long flexible lead connected to the negative terminal is used to test the insulation resistance of the various electrical equipment and the wiring by touching this to the various controller fingers. The insulation resistance in ohms corresponding to any scale reading may be computed by the formula:

$$\text{Insulation resistance (ohms)} = \text{resistance of voltmeter (ohms)} \left(\frac{\text{line voltage}}{\text{meter reading}} - 1 \right)$$

with 550 volts on the line a reading of 10 volts on the particular meter used at Utica corresponds to an insulation resistance of approximately 3½ megohms. Experience at Utica has shown that any part which shows a resistance of less than 3½ megohms, which corresponds with a reading of more than 10 volts, should be repaired at once or trouble will result.

In making the test of the controller insulation the reverse drum must be centered so as not to make contact, all switches leading to grounded equipment must be turned off and the permanent ground to the motors must be removed. By touching the R-7 resistance finger, the insulation resistance of the wiring and grid resistors is measured. Armatures and fields of the motors are tested by touching the corresponding fingers in the controller.

Controller trouble is easily located by this test. Where composition finger boards are used, carbonization or dirt between bases frequently causes considerable leakage of current. It is difficult to discover such points by visual inspection, but by applying the insulation resistance test the weak points are quickly located. Where armature contacts show a leakage the motor brushes are removed and each armature lead and the armature itself is tested separately to locate the weak spot. If the leak is in the field contacts the fields are separated and tested individually.



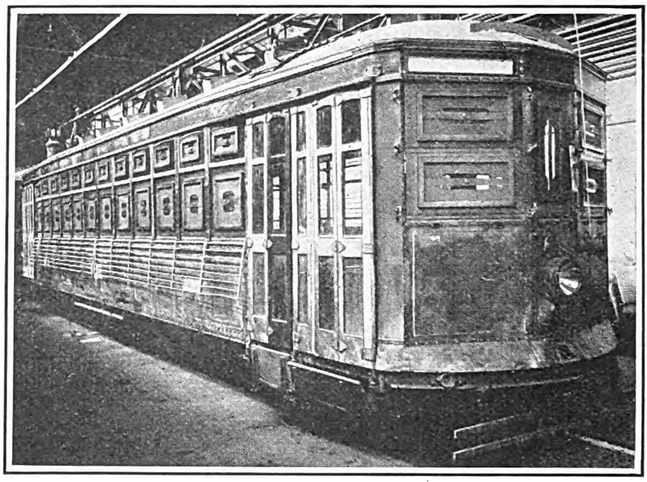
At Top, Controller Drum Body Castings Built Up by Brazing. At Bottom, Finished Body Castings After Welding

Improved Window Guard for Spray Painting

Rubber Vacuum Cups Pressed to Window Glass Securely Hold the Guard in Place While Car Is Being Spray Painted

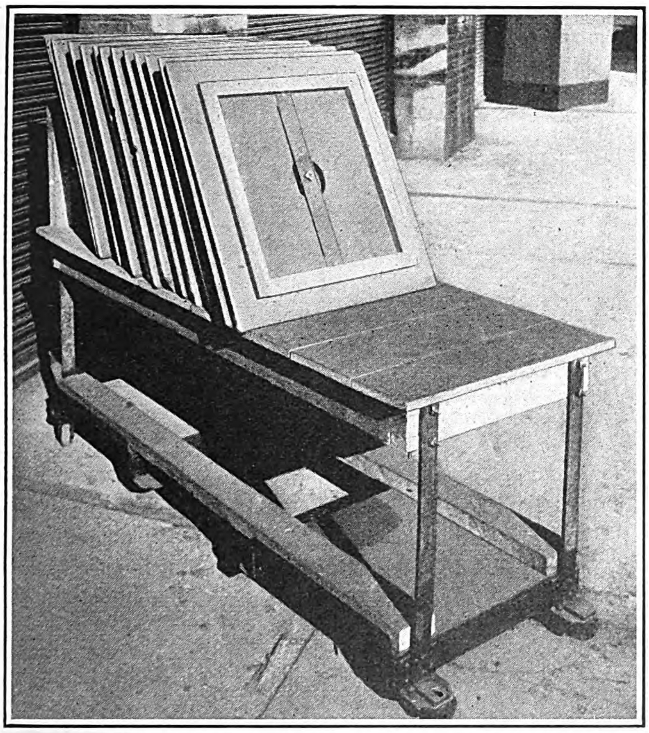
By J. H. Lucas
Superintendent of Equipment the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

One of the problems encountered in spray painting cars when the sash are not removed during the process of painting is that of devising a satisfactory method of protecting the glass from the paint. Since early in 1921, when the spray method was adopted for painting and varnishing cars at the Cold Spring shop of the Milwaukee Electric Railway & Light Company, various types of guards have been tried out to protect the car windows and other surfaces that were not be coated. One of the first methods tried out to protect the window glass from the paint used on the exterior of the car was to use cardboard guards tacked over the windows. This procedure was slow, the cards bent readily and pieces broke off in the corners. After about two months trial this method was discontinued in favor of covering the glass with a special paste of calcium chloride and flour. The paste was intended to prevent the paint from adhering to the glass. With this plan it was found that in summer the windows could be readily cleaned by scraping and washing, but in cold weather the paste solidified and made the cleaning of windows after spray painting rather difficult and expensive.



Vacuum Cups Hold the Guards in Place Over the Windows While Cars Are Spray Painted

The next method tried was to paste paper on the windows before painting. This was tried on a number of cars, but the method was found slow and expensive. Considerable labor was involved in cutting the paper to size, pasting it on the glass and then scraping off the paper and cleaning the windows. A wooden guard was next developed that could be clamped in place in front of the sash and readily removed after painting. This type of guard was used for over a year. It was described in an article on the spray painting practice in Milwaukee, published in ELECTRIC RAILWAY JOURNAL for July 7, 1923, page 3. The wood guards were quite satisfactory when new, but in time they warped out

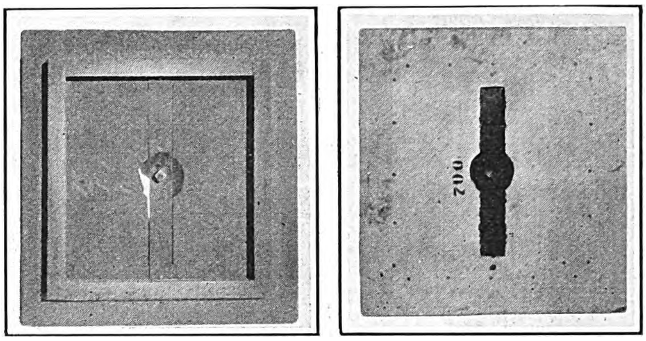


Guards Are Transported About the Shop on a Small Hand Truck

of shape and paint adhering to the sliding members made it increasingly difficult to clamp them in place. In addition, when these guards had been used several times for applying a coat of color or paint the edges became heavily coated with the color material and they would mar the finish when used with a varnish coat. This required expensive touching up after varnishing.

In experimenting with methods of improving these guards attention was called to the type of small rubber vacuum cup which when pressed against glass or any other smooth surface adheres tenaciously. It was found that this device would work satisfactorily for holding guards over the windows while spraying painting, and a new type of guard was developed. This is shown in accompanying illustrations. The new guards are made of press board or Agasote in various sizes to fit the different sash. The small rubber vacuum cup is fastened to a metal cross-piece. Wood stiffeners are placed on the back of the press board, as illustrated.

These guards are less expensive to make than the previous wooden clamp type. They can also be more quickly put in place and removed than the earlier type and they overcome most of the undesirable features previously encountered. The labor for setting and removing the guards has been reduced one hour, while the touch-up and cleaning labor after spray painting has been decreased approximately 2½ to three hours per car. A small truck or cart, illustrated, has been constructed for conveniently transporting a complete car set of guards from the storage rack to the car to be painted.



New Type Window Shield

At left, guards of press board or Agasote are reinforced with a light wood frame to prevent warping.

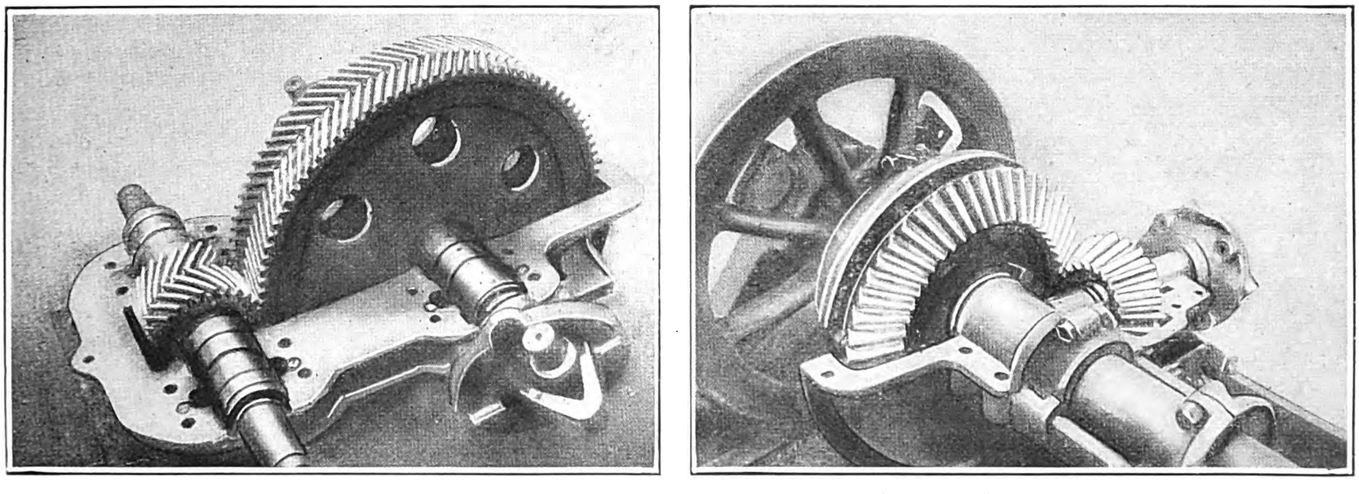
At right, view of the inner side of the guard. The small rubber vacuum cup that holds it in place against the glass and the metal strip to which the cup is attached are shown.

Lubricating Motor Gears

German Operators Favor Cast-Steel or Pressed Gear Cases—Complete Immersion of Gears in Oil Is Considered to Give Highest Efficiency

TOO much attention cannot be paid to producing an absolutely dustproof, waterproof and oilproof gear case. The existing forms are far from fulfilling the basic requirements. Only cast steel or pressed steel casings have given satisfaction, according to an article by Chief Engineer Willenberg of the Wiesbaden Street Railway published in *Verkehrstechnik.* Their manufacture requires expensive patterns or dies. Designs with rivets, welds or their combination have failed because they cannot withstand the rough service. Every time such a casing hits a high paving stone or other obstacle, it becomes dented and rips open. The chief reasons for these failures are the use of too thin steel and welding at the wrong place, usually at the edges.

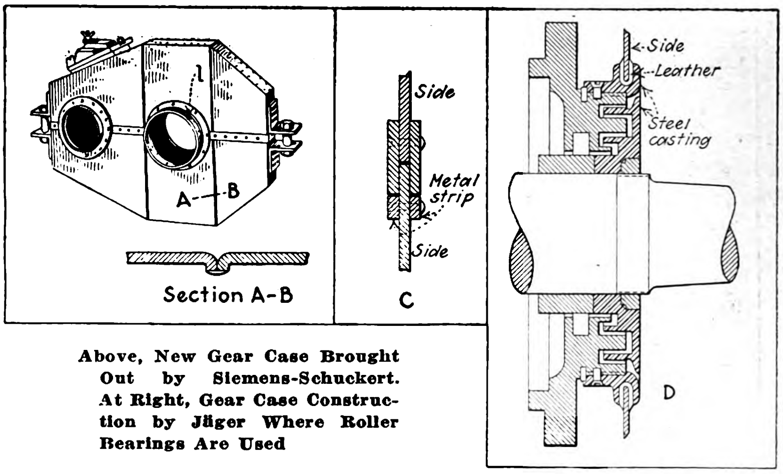
The Siemens-Schuckert Company has tried to obviate



Gearing Between Motors and Driving Shaft of Albrecht-Krupp Car

At left, gearing between motor and transmission shaft; at right, bevel gearing to wheel axle this trouble with a new design, shown in an accompanying illustration. The seams are located at the sides, and are made on bent-over edges, which not only give better welds but also reinforce the casing, as shown in section *A-B*.

To make a tight joint between the upper and lower parts a long overlap with a felt gasket is used. Such a joint is sealed more effectively against water splashed against it by adding metal strips, as shown at *D* in the illustration. Repairs are expensive in case of damage, but certain sacrifices have to be made to perfect a tight case.



Above, New Gear Case Brought Out by Siemens-Schuckert. At Right, Gear Case Construction by Jäger Where Roller Bearings Are Used

The opening for the axle requires difficult construction, and very little has been done so far to remedy this. With the wheel gage of 1 m. (39 in.) commonly used in Europe little space is available for a well-designed stuffing box. The best construction used so far consists of a disk of leather which stands on edge against the axle and grips it tightly. The Siemens-Schuckert design uses a wide leather collar indicated as *l* in the illustration. This reaches over the shoulder of the axle bearing. It is pressed tightly around the shaft by a clamp to prevent the entrance of water and dirt. This construction, however, does not prevent the oil or grease from a leaky casing getting out.

Where the armature shaft passes through the sheet steel casing, an edgewise leather disk or a narrow leather collar has been used, as on the outer axle hole. It is found frequently that the wall of a cast-iron case rests directly against a groove in the shaft, with nothing in between. But this hole, like the leather disk, is quickly hammered out due to its short distance from the casing support. This construction is ineffective because it is not only essential to keep road dust out of the casing and away from the armature bearing, but also to prevent the gear case lubricant from being drawn into the armature bearing. There is usually a negative air pressure in a motor, so that a barrier must be provided between the casing and the bearing.

The firm of Jäger in Elberfeld, in co-operation with the railway system of Berg, has brought out a gear case design, as shown, for motors with roller bearings. A deep groove fitted with leather gives an effective protection toward the outside, while a throw-ring returns dripping oil back into the gear case, keeping it away from the bearing.

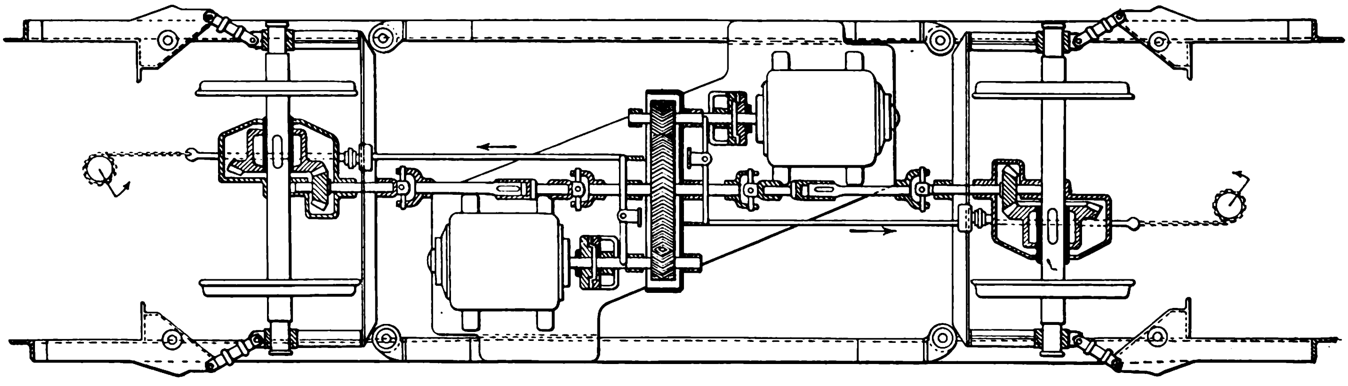
The real goal to be sought in gear lubrication is complete immersion of the gears in an oil bath. This gives highest efficiency, smallest wear, and least oil and maintenance cost. Only two trolley systems are known to the author which actually use such an oil bath. One of them is the worm drive car built by the Oerlikon company in 1905 for Zürich, about which no details are available. The other case is the Albrecht-Krupp car. Both of these car constructions are materially different from the customary design with suspended motors. In both of these cases the motor is fastened to the car body, with its axis parallel to the rails.

The new Albrecht-Krupp car differs from that of Dortmund only in that each motor has its own pinion. The first completely inclosed gear operates in an oil bath in a heavy cast-iron gear casing. Both pinion and spur gear have double side bearings and are equipped with angle-teeth with such an angle of inclination that the same number of teeth are always in mesh. Connections to the axles are by bevel gearing, also operating in an oil bath. The pinion is in one piece with the shaft, and has double bearings. The halved large bevel is spring-connected to the car shaft.

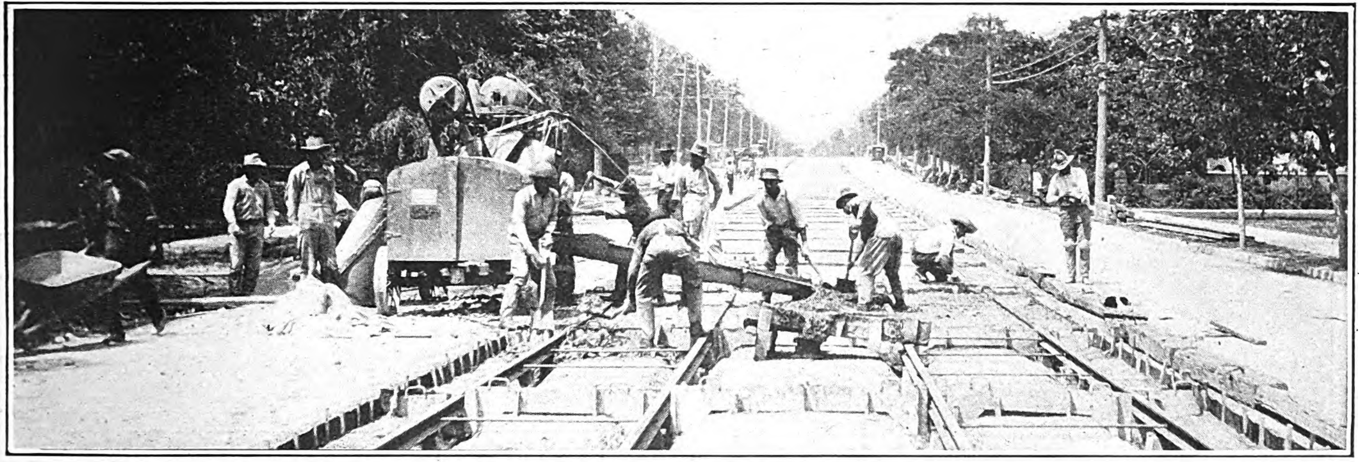
The Albrecht-Krupp car has two gears in series whose over-all efficiency is equal to the product of the efficiencies of the individual gears. Endeavors are already under way to try to get along with only one set of gears per motor.

Tons of Copper in Boston Elevated System

STATISTICIANS of the Boston Elevated Railway have calculated that the total weight of copper in the transmission and distribution system of the company is 6,584 tons. Of this, 511 tons are in trolley wire, 708 tons in transmission cables and 5,365 tons in the distribution system, including overhead and underground feeders and return. In 1923, 82 miles of trolley wire and 91 miles of span wire were installed and 41,900 trolley cars were used.



Driving Mechanism of Albrecht-Krupp Car—Each Motor Has Its Own Pinion Bevel Gearing Drive to Axles



Monolithic Concrete Track Construction in Hot Springs with Expansion Joints Every 15 Ft. Held in Place Temporarily by Means of Steel Templates

Tieless Track Laid in Hot Springs, Ark.

Federal Light & Traction Company Has Adopted a Standard Type of Track Construction Using Longitudinal Supports for the Rails and Monolithic Concrete for Subgrade and Paving—Maintenance Costs Have Been Reduced Materially

By G. J. Gauthier
Engineer Federal Light & Traction Company

CONFRONTED several years ago with the necessity of making additional capital expenditures for street paving and also with increased operating costs, the Federal Light & Traction Company of New York, which controls street railway systems in Hot Springs National Park, Ark.; Springfield, Mo.; Las Vegas, N. M.; Tucson, Ariz.; Aberdeen, Wash., and elsewhere, made a careful study of track and paving design. As a result, it has adopted as its standard track structure an unusual type of tieless concrete construction, which has greatly reduced maintenance cost and provides a smooth and hard surfaced pavement.

In 1915 this company laid its first tieless track in Tucson, Ariz. The following summer the same type of construction was tried in Hot Springs National Park, Ark., the installation being made on a line where a seven-minute headway was operated. Experience there with this tieless structure during the ensuing eight years was so satisfactory that 12,500 sq.yd. of right-of-way was rebuilt in the same way in 1924. Under franchise agreements the railway is required to repave its own track area whenever the streets where it operates are repaved. An additional 2,300 ft. of double track right-of-way is now being reconstructed using this type of pavement.

The outstanding features of this design are the elimination of ties and the use of concrete as the material for both subgrade and surface paving. It has been found by the railway that when the proper aggregate is used and concrete is carefully placed, it makes an extremely durable pavement. Even where municipal regulations preclude the use of concrete paving for the entire street area, the company has secured permission to use it in the track area.

During the reconstruction of the track in Hot Springs last year traffic was maintained by means of emergency buses. It was possible to a certain extent to keep other vehicular traffic off the street during the construction period. After the concrete for the pavement had been poured the right-of-way was protected from all vehicular traffic during a period of 28 days by means of old ties placed end to end just outside the track area.

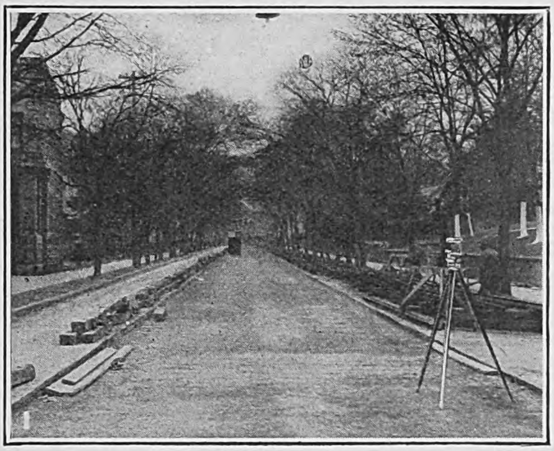
Old track was jacked up and torn out. Ties and rails were removed from the right-of-way before any work was done to prepare the subgrade. Excavation for the subgrade was made to the full width of the right-of-way. In depth, an allowance was made for the compression resulting from rolling. To compact the sub-base a 10-ton steam roller was used. After the subgrade had been evened up longitudinal ditches were cut to accommodate concrete supporting girders for the rails.

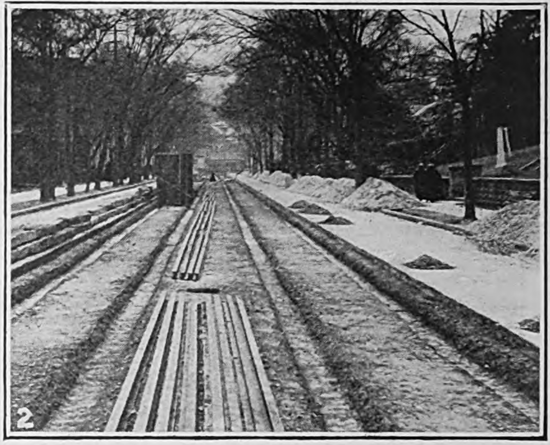
Standard construction of the Hot Springs Railway includes 60-lb. A.S.C.E. T-rail. In most cases, if the old rail does not show signs of serious wear it is relaid again after it has been thoroughly cleaned of dirt and rust. While continuous joints were installed in the track laid in 1916, "Apex" welded joints were used entirely in the work done in 1924.

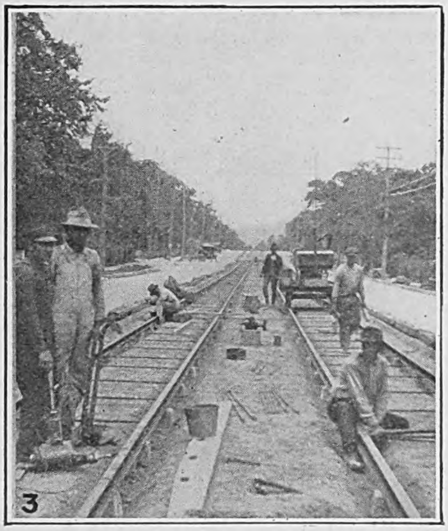
On straight track and on curves having a radius of 2,000 ft. or more, tie rods of ¾-in. diameter were spaced 5 ft. apart. They were spaced 3 ft. apart on curves having a radius less than 2,000 ft. and more than 300 ft. Spacing was 2 ft. 6 in. on curves with a radius of less than 300 ft.

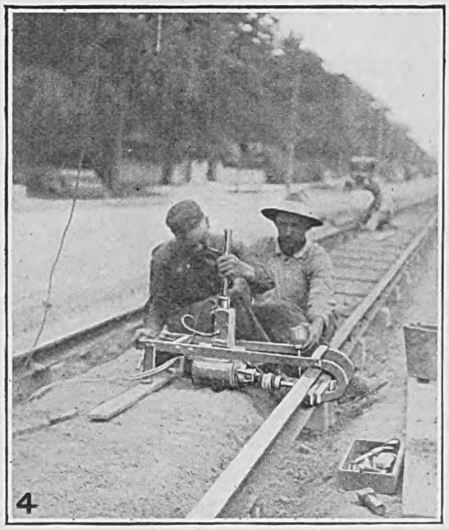
During the assembling of the new track the rails were supported on concrete or brick piers placed about 5 ft. apart. The track was finally brought up to exact grade by means of hardwood wedges driven between the tops of the piers and the base of the rail. A final

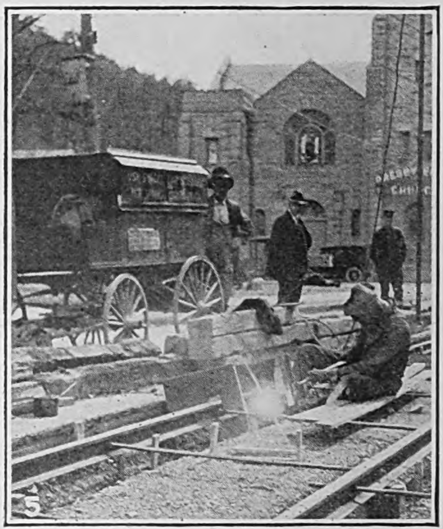
Successive Stages of Tieless Track Construction

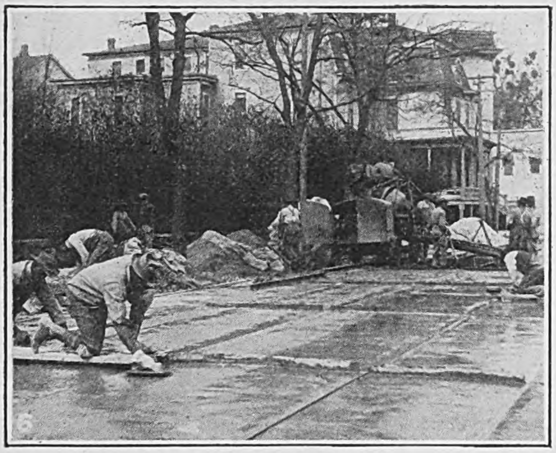












No. 1—Subgrade was excavated the full width of the right-of-way and then compacted with a steam roller.

No. 2 — Trenches were excavated for longitudinal concrete beams to support the rails.

No. 3 — Concrete blocks support track. Oak wedges placed between top of block and bottom of rail were used to bring track to final level.

No. 4 — Drilling holes preparatory to installing the tie rods.

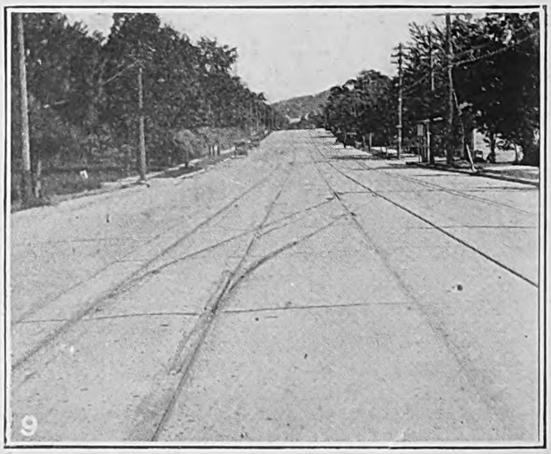
No. 5 — Apex welded joints were installed by the railway's track gang.

No. 6 — Wood floating of finished concrete surface.

No. 7—A 1½-in sand covering was kept wet for three or four days immediately following pouring of concrete

No. 8 — Concrete pavement was kept closed to all traffic for 28 days, right-of-way being protected from traffic with old ties.

No. 9 — Double-track concrete pavement of the tieless type on Central Avenue, Hot Springs, Ark.

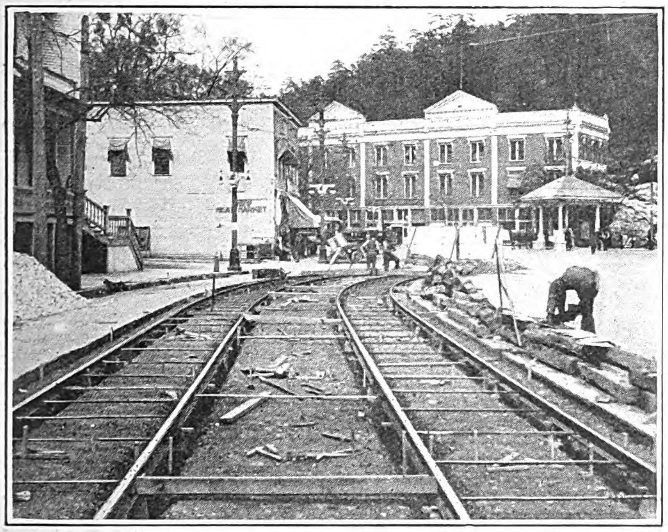


lining of the track was done with a transit, and temporary braces were placed every 10 ft. to hold the line during the pouring of the concrete. All of this work was done by the construction forces of the Hot Springs Street Railway under the supervision of an engineer from the New York office of the Federal Light & Traction Company. Under favorable conditions as much as 500 sq.yd. of pavement was laid in the course of a single day.

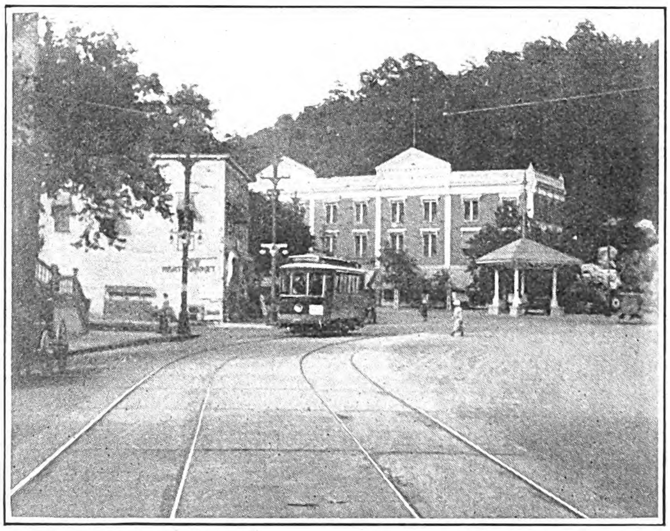
For the sub-base a concrete mixture of 1-2½-4 was used, while the surface topping was a 1-2-2 mixture. For the aggregate clean sharp river sand was used, together with crushed stone of size not larger than would pass through a 2-in. ring for the base or through a 1-in. ring for the surface. Materials for the aggregate were dumped along the side of the street before the work commenced. Cement was delivered by small trucks in close proximity to the mixer.

A Jaeger gasoline-driven concrete mixer equipped with loading scoop and center swinging chute was mounted on a truck. The use of the swinging chute permitted the complete pouring of a section of track between expansion joints at one setting. The base was poured first and then the mixture changed for the top surface. A mixture sufficiently wet to puddle easily without the use of tampers was used. The top surface was poured almost immediately after the pouring of the base. Immediately after the top had been brought to a rough surface crowning of the track to form a flangeway was done by running a template over it. This template conformed to the cross-section of the finished surface and was worked back and forth across the mass until the concrete was brought to a true surface.

Lateral expansion joints were provided in the concrete structure every 15 ft. and extended entirely across the right-of-way. They were made locally and consisted of a filler of ½ in. of asphalt between two sheets of thin felt paper. The filler was cut to conform to the cross-section of the work and placed against a steel template made in pieces to facilitate removal, the asphalt filler projecting about 1 in. above the surface of the finished concrete. After the concrete had been placed the steel plate was removed and used again leaving the filler in place.



Track Reassembled, Surfaced, Lined and Blocked Up Ready for Concreting



Finished Appearence of Concrete Track Structure of the Tieless Type Used in Hot Springs, Ark.

The surface of the concrete was then finished with a wooden float. No shaping or floating was done after the concrete had taken its initial setting. Within twelve hours after the concrete was placed the top was swept lightly with a stiff broom to roughen the surface slightly, and it was then covered with a 2-in. layer of sand. This was kept moist for three days. The freshly concreted track area was kept closed to all traffic, both railway and vehicular, until the concrete had hardened.

Aside from a few temperature cracks which developed in the concrete surface and which were filled in with hot asphaltum, the concrete track pavement laid in Hot Springs National Park in 1916 does not show any appreciable wear. No low joints have been found after more than eight years of service, and the only maintenance which has taken place has been to refill the expansion joints once or twice a year with hot asphaltum. Thus paving repair and replacement has been practically eliminated, and no track maintenance has been required. This is probably accounted for by the solidity of this type of concrete construction used, the design allowing no wave motion of the rail after it has been concreted in, while the rail is also protected against any lateral movement. Moreover, there is ample strength in the concrete to support both rail and vehicular traffic.

The cost of this type of construction has varied somewhat with the town in which the work was done. For the work done in Hot Springs, Ark., in 1924, cement cost $3.13 net per barrel delivered on job, sand $2.35 and crushed rock $3.60 per cubic yard delivered, common labor $3 per day of nine hours. On a piece

COST PER LINEAL FOOT OF DOUBLE-TRACK RIGHT-OF-WAY

Excavation and earth removal, including rolling and tamping	$0.598
Track labor, including removal of old track, cleaning of rails, drilling and installing tie rods, welded joints labor, reassembling of track, lining and surfacing, including also watchman and timekeeper	1,339
Track materials, including new rail needed for replacement, special work, welded joints and welding materials, all bolts, tie rods and roadway tools	1.712
Concrete labor, mixing, placing, finishing	.572
Concrete materials, all cement, sand, crushed stone, expansion joints, including proportional cost of concrete mixer	4.257
Grand total labor and materials	$8.478

of double-track right-of-way 17 ft. 9 in. wide, 3,529 ft. long, including the installation of a crossover, expenses were as given in the table on page 617.

As there are 1.97 sq.yd. of pavement per lineal foot of track, the entire cost of preparing the track as well as the cost of pavement was approximately $4.30 per square yard.

Use of Undersize and Oversize Armature and Axle Bearings

Variation of the Distance Between Armature Shafts and Truck Axles Causes Many Motor Troubles—Close Fitting Bearings Are Essential to Accurate Alignment

By P. A. Pontius

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

IT IS very important to maintain the gear center distance on railway motors closely and essential to pay particular attention to armature and axle bearings. Both are subject to wear inside and outside, thus affecting the gear center distance.

When a motor is put in service the armature shaft will wear down and the original bore of the armature bearing will increase, losing the close fit between shaft and bearing bore. Thus the armature gear center distance will be lost. By using undersize bearings (i.e., bearings with smaller bores than on new motors) the original condition of a new motor can be regained. To meet this condition some railways have made up standard undersizes of bearings for each type of motor. Five different bores for each bearing have been developed by one manufacturer, the diameters varying by increments of $\frac{1}{32}$ in.

On each of these five different sizes the babbitt lining is kept $\frac{1}{16}$ in. thick as on bearings of new motors. This is done in order to prevent the armature from touching the pole tips in case the babbitt lining should melt due to overheated bearings.

When a worn armature bearing has to be replaced, the diameter of the shaft-bearing surface should be calipered. If worn undersize it should be machined smaller to the nearest size of bearing bore mentioned above. The maximum amount that the shaft is reduced by wear and turning should be limited to $\frac{1}{8}$ in. less than standard. If the shaft journal is reduced more than $\frac{1}{8}$ in. smaller than standard, the shaft may be weakened to such an extent that it should be replaced.

Oversize Outside Diameter—In the foregoing it is assumed that the outside diameter of the bearing is standard and has a good tight fit in the housing or motor frame, according to the design of the motor. When bearings become loose in their seats (in housing or motor frame) it is necessary to provide an accurate fit again. This may be done by reboring the bearing seat and using oversize bearing shells or by building up the seat through welding and reboring to standard size. Where oversized bearings are used they should have an outside diameter $\frac{1}{8}$ in. larger than standard and with the five different bores mentioned.

If the housing bore can be welded satisfactorily so as to avoid distortion or misalignment of the housing fit in the frame, the oversize bearing can be eliminated by reboring the housing to standard size. The use of shims to hold worn bearings tight in the worn housing or motor frame is not good practice. The wear at the bearing seat is not the same at all points of the surface fit and, therefore, the use of shims will shift the center of the bore, since the bearings will collapse more at the high points of contact. As a result the gear center distance and the air gap will be different from those for which they were originally designed. Excessive collapsing of the bearing shell may also lead to hot bearings if the bearing is not bored or broached after it is pressed into the housing. When the strength of the casting will permit, the worn seat should be rebored to a diameter $\frac{1}{8}$ in. larger than standard.

If the outside diameters of bearings are increased in steps of $\frac{1}{32}$ in. in the same way that the diameter of the bore is decreased, 25 different sizes of bearings for every shaft journal would be needed. If the outside diameter is limited to two sizes (standard and $\frac{1}{8}$ in. oversize), five different bores in steps of $\frac{1}{32}$ in. will require a total of ten different sizes. This should be the extreme limit of variation. With these ten sizes, and renewal of the shaft and housing after the $\frac{1}{8}$ in. undersize journal fit and the rebored housing are worn out, it is possible to keep close gear center distance.

A further reduction from ten to six sizes of bearings for every shaft journal can be obtained, if increments of diameter of $\frac{1}{16}$ in. instead of $\frac{1}{32}$ in. are used for the undersize bearings. This would lead to the following preferred sizes: (1) Standard outside diameter with standard bore, (2) standard outside diameter with $\frac{1}{16}$ in. undersize bore, (3) standard outside diameter with $\frac{1}{8}$ in. undersize bore, (4) $\frac{1}{8}$ in. oversize outside diameter with standard bore, (5) $\frac{1}{8}$ in. oversize outside diameter with $\frac{1}{16}$ in. undersize bore, and (6) $\frac{1}{8}$ in. oversize outside diameter with $\frac{1}{8}$ in. undersize bore. The above preferred line of undersize bearings has already been accepted by some operators.

The production of undersize bearings by increasing the thickness of babbitt lining to $\frac{1}{8}$ in. and reboring the babbit lining to fit the worn shaft has two disadvantages. The safety feature which is obtained by use of a $\frac{1}{16}$ in. lining, so that the armature does not touch the poles in case of hot bearing trouble, is lost. Furthermore, the Brinell test of babbitt shows that the highest Brinell figure is obtained at the surface of a poured test piece. Therefore, it is good practice to mold the babbitted bearings as closely as possible to the finished size in order to increase the life of the babbitt lining.

To standardize on the two different outside diameters only has the advantage that the best wearing surface is obtained on the outside of the bearing as the castings are produced from either standard outside or $\frac{1}{8}$ in. oversize patterns. The closer the bearing shells are finished to these two sizes, the more they will stand outside wear, as the Brinell test on castings shows that the highest Brinell figure is obtained close to the surface of the casting.

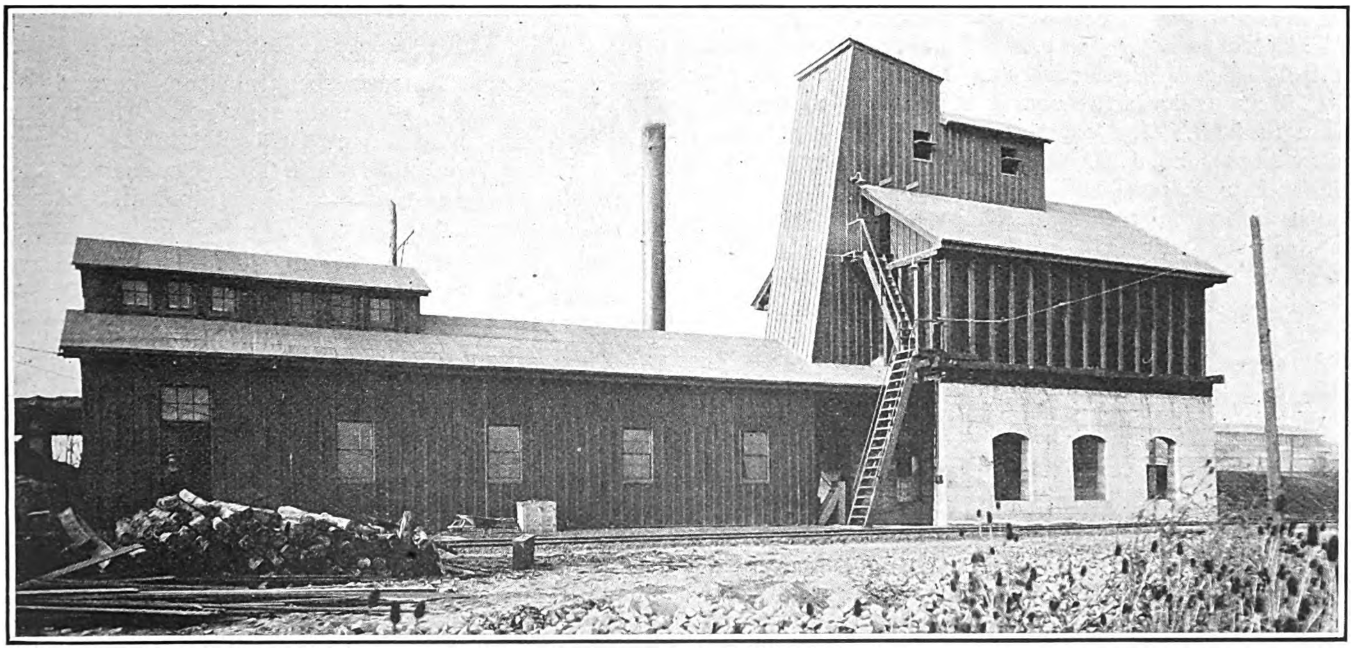
AXLE BEARINGS SHOULD NOT BE NEGLECTED

As the speed of rotation in the axle bearing is very much lower than the speed in armature bearings, the wear is correspondingly less. This leads to the neglect of axle bearings. They are, however, just as important in regard to the gear center distance as armature bearings and operators should take the same precautions with them as with armature bearings. If different sizes are decided upon, no smaller steps than $\frac{1}{16}$ in. difference in diameter of bore and outside diameter should be selected.

Modern Drying Plant Cuts Sand Cost in Half

Direct Heat Rotary Drier of the United Railways & Electric Company Is Operated by Three Men Working Nine Hours a Day Instead of Twelve Men Working Twelve and 24 Hours

AN IMPORTANT reduction in the cost of obtaining dry sand has been secured by the United Railways & Electric Company of Baltimore through the operation of a modern drying plant. This company operates some 1,500 cars in Baltimore and surrounding towns. Formerly it required a force of twelve men working in shifts 24 hours a day to maintain an adequate supply of sand when stoves were used for drying. The cost of drying sand and the manual labor of handling at that time was very high. Some years ago the railway decided to replace the old system by modern methods and built a plant which can be operated by three men. This plant is now operated only part of the time. The cost has been reduced to approximately half of what it formerly was.



Sand Is Dried in the House at the Left, from Which It Is Carried by a Bucket Elevator to the Storage Bin at the Right. From There It Is Dropped Directly into the Work Cars of the Railway

The new plant was designed by and built under the direction of the engineering department of the company. Wet sand is delivered by cars on an elevated trestle 228 ft. long and 12 ft. above the storage floor. This trestle is designed to carry either steam railroad or electric railway cars and to permit both center and side dumping.

From the storage pile below the trestle the sand is shoveled by hand into the pit of an elevator. The latter raises it and drops it into a chute opening directly into a rotary drier. After passing through the drier the sand falls into another pit, from which it is raised by a bucket elevator into the storage bin. Here the sand is separated from the gravel, which passes into a separate bin.

The drier itself is a revolving steel cylinder in which wet sand is agitated until the moisture has evaporated. Heat is generated under forced draft and the hot furnace gases pass through the revolving cylinder. Inside are a number of steel angle shelves which lift the sand and drop it as the cylinder revolves. Two heavy steel tires encircling the cylinder rest on cast-iron rollers. Rotation is imparted by a spur gear meshing with a gear ring which encircles the cylinder of the drier.

The furnace has a grate surface of 25 sq.ft. Using old wood ties for fuel, the drier has a capacity of approximately 5.5 cu.yd. of sand per hour. Its capacity is about 8 cu.yd. per hour using bituminous coal for fuel. This increase, however, is more than offset by the greater cost of coal. The railway therefore has adopted the practice of using its discarded ties for this purpose, as they are available in large quantities at practically no cost. Some disposition of old ties must be made in any case, as they cannot be allowed to remain alongside the rebuilt track, and to transport them to the sand drier is as easy as to get rid of them in other ways.

Heavy timber construction is used for the drier house, which is 22 ft. wide by 16 ft. long and 13 ft. high at the eaves. The storage bin for dry sand is supported on three reinforced-concrete walls. Below it are chutes to deliver the sand directly into cars. A tower between the drier and the storage bin houses the elevator and its mechanism.

Wood ties are cut to suitable lengths for use in the furnace by a circular saw operated by an independent electric motor. This is housed in a shed 20 ft. long, 12 ft. wide and 9 ft. high located at the rear of the drier house. Old ties are delivered directly to the saw shed by cars operated on a track running alongside the structure. A pile of such ties waiting to be cut up is shown at the left in the accompanying illustration of the drying plant.

At the end of the storage bin for drying sand is a gravel bin of 30 cu.yd. capacity. The gravel procured by the operation of this plant is a by-product that serves to increase the economy of operation. Formerly it was necessary for the company to buy gravel of this kind to be mixed with tar in making mastic pavement filler. More than enough for this purpose, however, is now secured as a byproduct of the sand drying plant.

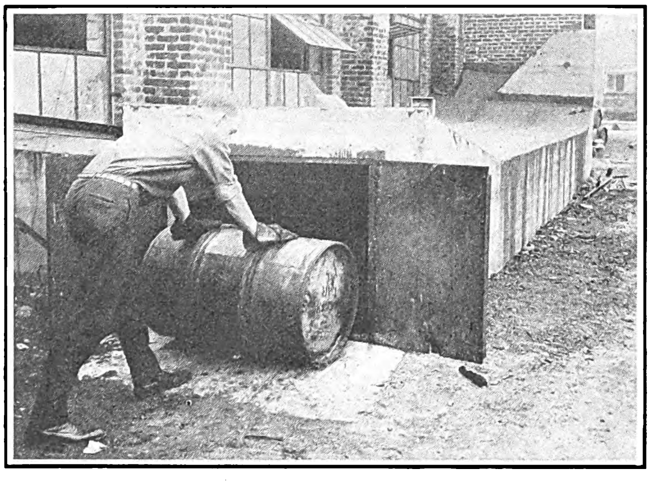
Underground Storage for Oils and Paints

Eighth Avenue Railroad, New York City, Has Provided a Solid Concrete, Fireproof Oil Storage House with Tanks and Self-Measuring Pumps Installed Below Grade

A SATISFACTORY storehouse for oils and paints located conveniently to the shop and also to the supply track has been provided by the Eighth Avenue Railroad, New York, in an interesting manner. The side of the shop on which the supply and storage tracks are located has windows extending down to within 4 ft. of the ground. As these were essential for efficient lighting of the shop, it was desirable in constructing any new building not to interfere with the entrance of daylight. This difficulty was overcome by making the principal part of the new oil storage house below grade, with the part above the ground level only sufficient to permit the containers to be rolled through an opening in the end of the structure when filling the underground tanks. This method of handling provided for filling at a single level, so that hoisting equipment for handling the barrels was unnecessary.

The storage house for oils and paints is constructed entirely of reinforced concrete. It is 30 ft. long and 9 ft. 6 in. wide inside and is provided with a headroom of 8 ft. The concreted walls are 12 in. thick below grade and 8 in. thick above. A stairway built of concrete is provided at one end, so that supplies can be obtained by the men for maintenance purposes as drawn off through self-measuring pumps. Two sheet-steel doors at the opposite end of the oil house above the ground level provide an opening for rolling in the containers as they are delivered.

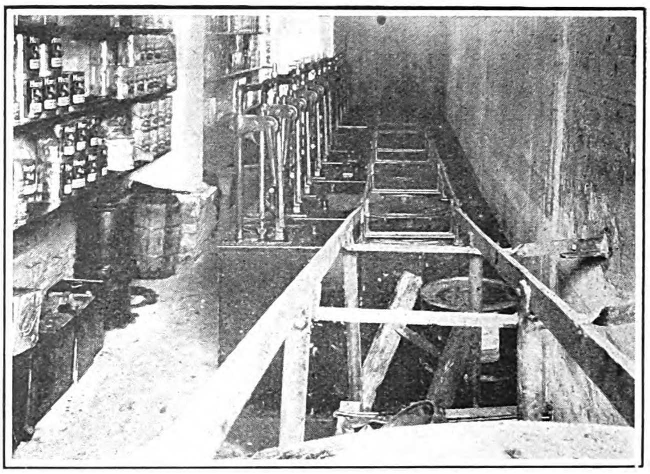
Arranged along one side of the oil house are eleven Gilbert & Barker tanks with self-measuring pumps. These provide storage for car oil, black oil, compressor oil, auto oil, switch oil, kerosene, asphalt paint, insulating paint, linseed oil, turpentine and alcohol.



Rolling a Barrel of Car Oil into Position for Filling the Tanks in Underground Oil Storage

From the opening where the containers are rolled into the oil house a steel framework is sloped down to a level just above the tops of the tanks, forming a runway on which the containers can be rolled into position and stopped at any point over the manhole of the proper tank so that the contents run into the tank without difficulty. Thus no hoisting equipment is needed. This is accomplished with a minimum of labor and time, and there is no danger of damage to containers or waste of lubricants.

The floor of the oil house is of concrete with drains to insure dryness. Ventilation is provided by two rotary ball-bearing ventilators installed on the roof.



Interior of Storage House for Oil and Paint

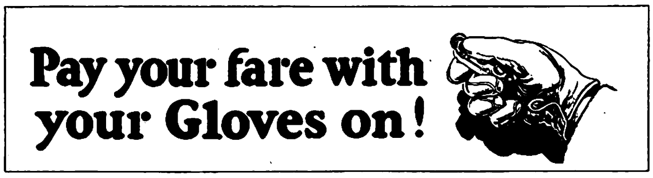
Storage of paints in cans is taken care of by three shelves extending the entire length of the house on the opposite side from the oil storage tank. The larger containers and those having semi-solid lubricants are stored on the floor underneath the lower shelves.

The oil storage is heated by steam pipes hung from the ceiling and light is furnished by four 50-watt lamps controlled from a switch at the stairway.

Magazine Token Holders in Philadelphia

LAST September the Philadelphia Rapid Transit Company raised its fare to 8 cents cash, with two tokens for 15 cents. At the same time the company decided to provide a holder for the tokens to popularize their use and lessen the time consumed on the car in change-making and fare collection. It was believed that this would help the cars, particularly the one-man cars, to maintain their schedule speed.

The holders, or "carfare carriers" as they are called in Philadelphia, have a capacity of 12 tokens each. The payment of $1 by a passenger to the conductor or car operator entitles the passenger to a carrier with 12 tokens and also a ride. On the basis of 7½ cents for a ride, this charge is equivalent to the sale of a holder for 2½ cents. The cost of the holders is about 4 cents each to the company, but the difference between cost and selling price, 1½ cents, is absorbed by the company.



Pay your fare with your Gloves on!

Car Card Advertising the Token Holder in Philadelphia

As the holder is practically indestructible, it is realized that sales of holders will eventually fall off and regular passengers will need tokens, and to cover this situation the company has established a rate of $3 for 40 tokens. This is called a "family package" and is expected to be popular with the heads of families and others who wish to purchase a considerable number of tokens at one time. From these packages customers will fill their existing token holders.

The Philadelphia Rapid Transit Company has popularized the use of the holders through references to them in "Service Talks," car cards, etc. An accompanying illustration is a reproduction of a car card advertising the holder. It points out that the passenger can pay his fare without removing his gloves. Up to date about 515,000 of these token holders have been sold in Philadelphia and they are being sold at the rate of about 15,000 a week. The holders, which are of steel, are made by the J. E. Mergott Company, Newark.

British Steam Railroads Carry Much Local Traffic in Cities

Comparison of Electric Railway Track Mileage in Six British and Six American Cities Is Likely to Be Misleading

BY WALTER JACKSON
Bus and Fare Consultant, Mount Vernon, N. Y.

AMONG the data in the report of the A.E.R.A. committee on foreign operation, published in ELECTRIC RAILWAY JOURNAL for Sept. 20, 1924, was a table comparing street railway track mileage, population, traffic, etc., in six British and six American cities. This mode of comparison has been used these last twenty years and suffers from the fact that it does not show the exceptionally important part played by the short-haul steam trains in most large British cities. The part played by the motor bus in urban transportation is another and later factor that deserves consideration.

In Edinburgh, for example, with a population of 420,000 the table shows 1.78 single track-miles per 10,000 inhabitants. A total of 71.8 single track-miles corresponds to 36.7 route-miles. But the Edinburgh transportation system also includes 35.25 miles (or more) of motor bus route. This service is of real importance, for in the fiscal year ended May 15, 1924, out of a total of 119,333,902 passengers 18,939,780, or about 16 per cent, were carried on the buses.

	Miles from City Station	Daily Trains Bozh Directions
Edinburgh District		
Portobello........	3.0	123
Turnhouse........	6.5	38
Eskbank.........	8.0	53
Glasgow District		
Partick West.....	2.25	157
Partick Central...	2.75	153
Rutherglen.......	3.5	153
Partick...........	4.25	186
Newton..........	6.75	86
Uddingston.......	8.50	77
Birmingham District		
Vauxhall.........	1.5	74
Norton...........	5.5	82
Manchester District		
Sale.............	2.5	120
London Road.....	8.5	128
Sheffield District		
Wincobank.......	3.5	50
Leeds District		
Bramley..........	3.75	58

This omission is of less importance than that of the short-haul steam railroad service, as the same table apparently did not allow for bus operation in the fairly parallel case of Washington, with 438,000 population. Both cities have buses to supplement the street cars, but only Edinburgh has steam service that is a big factor in the local transportation situation.

While no record is available of the number of passengers carried, the above figures taken from the official steam railroad time-table indicate that this business is far more extensive than in America except for a few cities like Pittsburgh, Boston and Chicago. In all cases 10 miles from the city station has been taken as a maximum.

Glasgow has the cheapest street railway fare in the world, but even so the tramway has powerful steam railroad competition. What the short-haul steam railroads are after in Glasgow and other cities are the long rush-hour trains which can be handled at low cost. Zone tickets are sold on the basis of twelve rides a week. In some cases there is no collection on the trains. They are operated with a minimum of personnel, the ticket being taken up as the passengers depart through the "closed" station.

From the figures in the foregoing table it can be judged that Glasgow has a very extensive system of steam rapid transit. Because the trains are long and the station spacing very short, the speed is not much more than 15 m.p.h. For example, there are eleven stops in the 7¾ miles between Maryhill and Rutherglen, eleven stops in the 10 miles between Clydebank and Springburn, nine stops in the 9¾ miles between Glasgow station and Hairmyres, and also nine stops in the 10½ miles between Glasgow and Bothwell. Unlike Edinburgh, Glasgow is only now beginning to use buses. Co-ordinated tram and bus service has long been operated in Birmingham, Manchester, Sheffield and Leeds.

From the foregoing notes it is plain that omission of the steam railroads and motor buses from tabulations of this sort impairs the accuracy of the comparison. It is scarcely justifiable to say that the rides per inhabitant per annum are 50 per cent greater in large American cities than in British cities of like size. Nobody really knows just what this percentage is because the British steam railroads do not keep an exact count of their commuter or "season" passengers.

The Readers' Forum

Calendar of Meetings Helpful

SOUTHWESTERN PUBLIC SERVICE ASSOCIATION
DALLAS, TEX., April 2, 1925.

To the Editor:

Just a word of thanks and appreciation for your editorial in the March 28 issue as to the list of forthcoming utility association meetings, which you are starting to publish.

This question of arranging convention dates to avoid conflict is one of great difficulty and correspondingly one of great importance, and the assistance of the ELECTRIC RAILWAY JOURNAL will be helpful.

E. N. WILLIS,
Secretary.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURG, PA., April 2, 1925.

To the Editor:

In looking over the March 28 issue of the JOURNAL, I was pleased to note on page 509 your list of coming meetings of electric railway and allied associations.

I think it is a very good thing to set aside a definite place in which to publish such a list every week. I believe there are sufficient changes to warrant this, and I am sure that this information is very helpful.

LESLEY C. PAUL,
Railway Section, Department of Publicity.

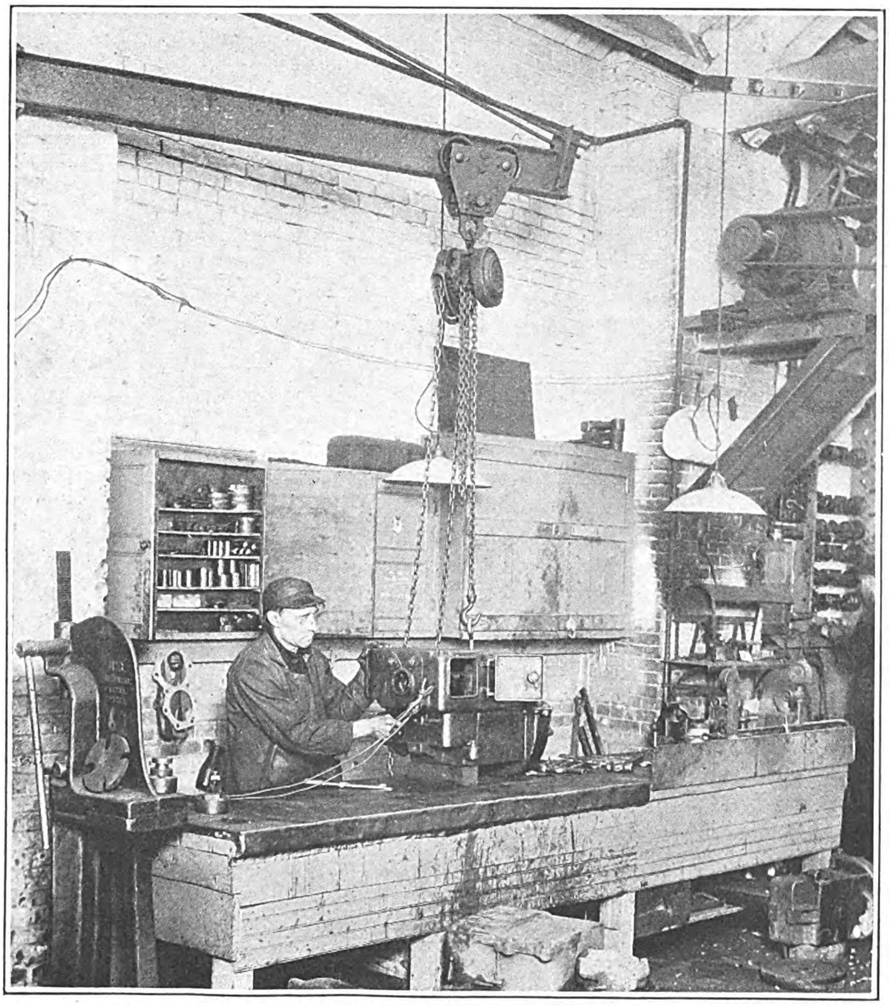
Equipment Maintenance Notes

Handy Compressor Overhauling Bench

ON A REGULAR overhauling schedule, compressors are removed from the cars and taken to the overhauling bench in the 155th Street shops of the Eighth Avenue Railroad. One section of the bench is devoted to the overhauling work and the other end is provided with gages, valves, etc., for testing the compressors after they have been reassembled. The overhauling end of the bench has a sheet-iron top which helps to keep oil and grease from the compressors. Located just at the end of the bench is a hand arbor press, which is used for pressing in bushings in various parts of the compressors and motorman's valves, when rebushing is necessary.

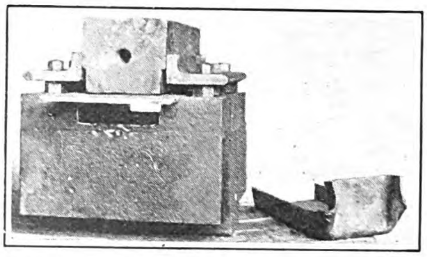
Much time and unnecessary walking is prevented by having storage closets immediately back of the bench. Parts which are renewed most frequently in compressor overhauling are kept in these closets, so that the workman does not need to go to the storeroom and spend time waiting for material when it is needed. A limited supply is kept in the closet, but sufficient to take care of each day's needs.

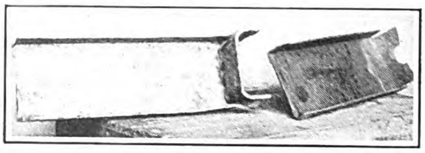
After compressors are overhauled they are given a running test on the bench. Tanks are installed underneath the bench, and the various gages are connected to show pressures and to indicate any leakages that may occur. This test insures that when the compressor is again installed on the car it will operate efficiently, and many adjustments which otherwise would be required on the car are done at the bench. A gib crane with chain block serves the bench, so that the compressors can be handled without labor.


Efficiently Arranged Compressor Overhauling Bench in Shops of Eighth Avenue Railroad, New York City

Forming Pedestal Gib Plates

THE New York State Railways experienced difficulty with its pedestal gib plates wearing thin at the bottom end and breaking at the bend. To remedy this condition the railway made up dies so that the gib plates are bent with a reinforcement at the bottom and corners. An accompanying illustration shows both the old and new plates, and it will be seen that the new plate is shaped with a projection of approximately 1½ in. at the lower end on each side. The corners are also well rounded, and as the new type is formed from a plate without cutting, additional reinforcement is provided at the side of the bottom projection.


Special Forming Die Used with Pneumatic Hammer to Shape Pedestal Gib Plates


At Left—New Type of Gib Plates with Reinforced Corners and Side Projections at Bottom. At Right—Old Type of Gib Plate Previously Used

These plates are formed by using a pneumatic power hammer, and the construction of the die is shown in another illustration. This consists of a heavy base block which is arranged to fit in the anvil of the power hammer. The center part of this block is hollowed out so that the sides of the gib plate will be formed as the upper part of the die is forced down. A slight recess in the upper section,

Dick Prescott Sees a Storeroom

And Is Favorably Impressed

VISITING the large Rushburg property on their trip of inspection, Dick Prescott, engineer of equipment, and Steve White, carpenter shop foreman of the Consolidated Railway & Light Company, accompanied the Rushburg engineer of equipment to the storeroom.

After being introduced to the storekeeper Dick stated the object of their visit.

"We are very much interested in your practice of eliminating duplicate parts," said Dick, "and we thought the storeroom was where the results would show up."

"You came to the right place," answered the storekeeper. "Let's come out here and you can see what we've accomplished."

Following the storekeeper out of his little office into the region of shelves and bins, Dick was impressed by the unusually clean and businesslike appearance. He noted, too, that no workmen were standing around waiting for materials.

"Now, in this section are what we classify as car-body fittings."

"You certainly have a mighty fine looking place," remarked Dick, glancing casually around.

"Thanks. We believe that a neat storeroom is the first step in efficiency. But you'll realize what reduction of duplicate parts means when I tell you this particular section occupies just about a third of the space it did two years ago."

"That, I take it," replied Dick, "is due to doing away with the many varieties of various parts."

"Exactly."

Leading them to several of the bins in the section, the storekeeper indicated the contents as he explained what had been done.

"Now, here are some examples. Two years ago we had ten different types of these grab-handle sockets. Each handle required one right-hand and one left-hand socket. Today we have three types. We had six different trapdoor handles. Now we have only one. There used to be four types of those conductor's signal bells. These have come down to one. There's our standard motorman's gong and bracket. We did have three different types and they wouldn't interchange between cars. The same thing is true of most of these handles, latches, hinges, hooks, register mechanism parts, and practically all the stock in this section. You can see for yourself that we rarely have more than two varieties of any part."

"It certainly looks like this plan is saving your company many thousands of dollars a year," said Steve White, whose many years of experience as carpenter shop foreman of the Consolidated at once enabled him to grasp the significance of this explanation.

"Yes," replied the storekeeper, "our mechanical department now realizes the saving being made in reduction of delays and handling, although it was inclined to doubt the program at first. But our own officials, outside of those in direct contact with the routine of purchasing and storekeeping, don't even now fully appreciate what we have accomplished from the statndpoint of reduced prices and prompt delivery."

"You mean that you don't have to order so many varieties of parts a few at a time?" queried Dick.

"That's it. Many of the old parts long ago became obsolete and had to be ordered in small quantities from samples. Consequently the prices were very high."

The four men moved along through the storeroom, and the obliging storekeeper pointed out many things he thought would interest the visitors. As they turned back toward the little office Dick consulted his watch.

"We certainly are very much obliged to you gentlemen," he said. "It has been mighty interesting indeed. I'm afraid, though, we'll have to hurry off without much ceremony now, as we planned on catching the interurban to Trackton this afternoon."

"You can just about make it," said the storekeeper. "Take a No. 4 car right out here at the corner. I don't envy you fellows that ride."

They had left the shop and were hurrying toward the corner, as Dick turned to Steve and said, "I wonder what he meant by that remark about the interurban?"

into which the plate fits, insures its being accurately centered over the opening in the base plate. The upper part of the die is guided by two angle irons, one on either side, which are bolted to the base.

With the plate in position for bending the power hammer drives the upper section of the die down and the sides of the plate are formed. While the plate is held firmly by the power hammer the end is bent up with a sledge hammer, and in this bending operation the projections at the bottom are left in their normal position as a reinforcement.

Meters Used as Reverse-Current Relays

THE Charleston Consolidated Railway & Lighting Company, Charleston, S. C., experienced trouble at its Five-Mile substation with two rotary converters racing when the voltage was interrupted on the a.c. feeders supplying the converters. The trouble was remedied by the use of two Sangamo type D-5 direct-current watt-hour meters arranged to act as reverse-current relays. The potential coils of both meters were connected across the main buses. The cables leading to the two machines were spanned as shunts to form the armature connections, one for each meter.

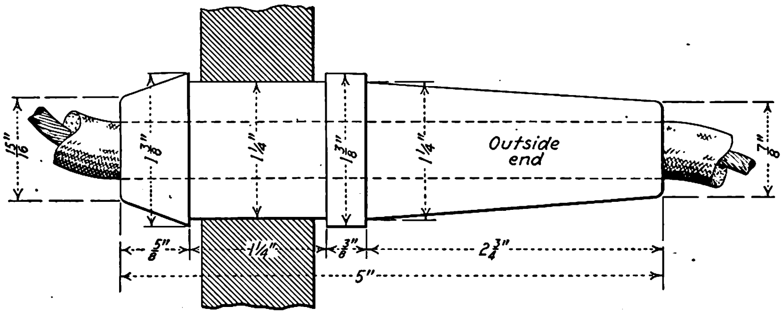
The gear trains were removed from the two meters. Leads were brought from the trip coils of the no-voltage release attachments on the machine circuit breakers. Each coil was connected to special contacts placed in the corresponding meter, one stationary and the other mounted on the meter disk. A stop placed in the meter prevents rotation in the direction opposite to the fixed contact.

With the rotary converters running at line voltage they are delivering energy to the line and the meters tend to run forward, but the stop prevents them. Should the voltage of a converter drop below the line pressure there is a flow of energy back into the machine. Then the meter disk swings backward, closing the relay contacts and opening the circuit breaker by short circuiting the no-voltage coil. This coil is in connection with a series resistor which prevents a complete short circuit.

This arrangement has provided a satisfactory type of direct-current, time-limit reverse current relay and has never failed to operate.

Rubber Bushing Protects Motor Leads

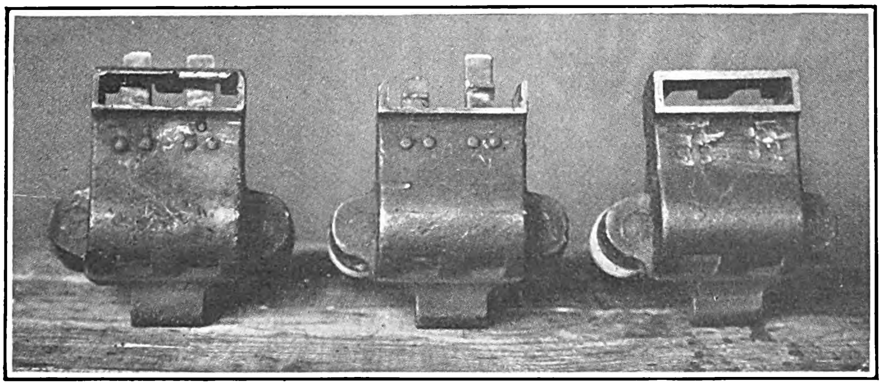
SHARP bends in motor leads, particularly at the points where they come out of the motor shell, often result in damage to the insulation and also cause breakage of the strands of the copper conductor. In order to prevent sharp bending at that point and also to provide an insulated bushing for the leads, the Department of Street Railways of the city of Detroit, Mich., uses a soft-rubber bushing of the type shown in the accompanying drawing. The end of this bushing extends outside of the motor shell for approximately 3 in. and so provides a support for the motor leads that prevents sharp bends. The inside end of the bushing is tapered, so as to facilitate ready insertion in the hole of the motor shell. The bushing is also provided with shoulders so that when once in place it will be held tight.



Soft Rubber Bushing for Motor Leads Used in Detroit that Prevents Sharp Bending

Repairing Brush-Holder Carbon Ways

WHEN the carbon brush ways of brush-holders used by the Utica lines of the New York State Railways become worn, they are brought back to standard size by cutting off the front portion and welding new cast-brass fronts onto the holders. The accompanying illustration shows the method of repair. The brush-holder at the left is one which is so worn that it requires repairing. The one in the center has had the front part cut off ready for the welding operation, while that at the right has been completely repaired. This method of repair insures an accurate fit of the brushes in the brush-holder slide and reduces troubles such as broken brushes and flashing, which result from too much clearance in the carbon ways.

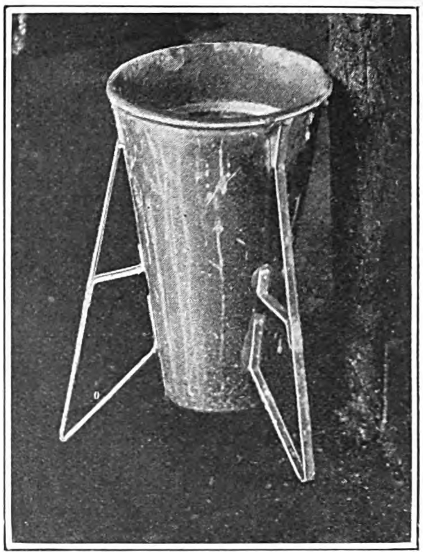


Revamping Brush-Holders on New York State Railways Lines
At left, brush-holder with worn carbon ways. In center, front section cut off preparatory to welding. At right, brush-holder after repairs are completed.

Convenient Acid Pot

SOLDERING acid is held in a three-legged conical shaped pot in the shops of the Department of Street Railways, Detroit, Mich. The pot is designed to stand on the floor instead of on a bench. Since the pot is deep and tapers toward the bottom, any splash of material falls back into the pot and is saved. Furthermore, the tapered shape causes any solid material which may drop into the pot to collect at the bottom, so that the acid can be used almost to the last drop without the necessity of cleaning the pot. A large saving in acid has resulted since this type of pot was put in use.

The pot is 12 in. high and the three legs raise the bottom an additional 1¼ in. from the floor. The inside diameters of the pot are 7¾ in. at the top and 4 in. at the bottom. The pot is constructed of No. 20 gage (0.032 in.) copper, and the inside is washed with lead. The three legs are made of ⅛-in. x ½-in. steel strap, and the bottoms of the legs are located on a 5-in. radius from the center of the pot. A removable cover is provided so that the acid is kept covered when not in use.



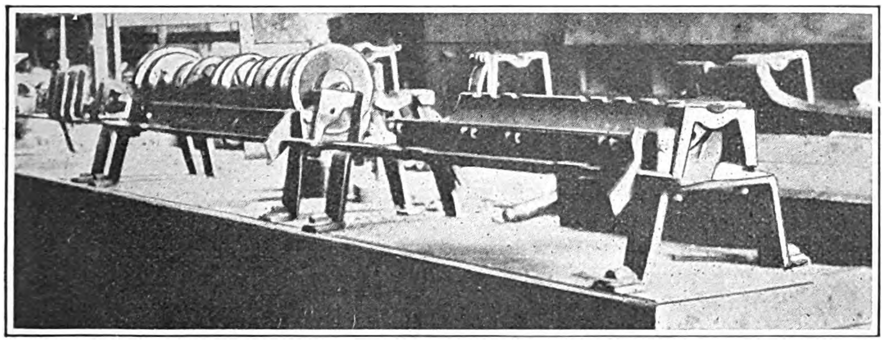
This Conical-Shaped Acid Pot Saves Material

Fixture for Checking Controller Drums

THE drums of platform controllers require particular attention in order to make certain that the contacts line up properly, that the star wheel is located so that the fingers will make contact at the proper points, that the stop for the controller drum does not permit overrunning of the fingers, and that the contact segments themselves have no high or low spots to cause uneven pressure of the contact fingers.

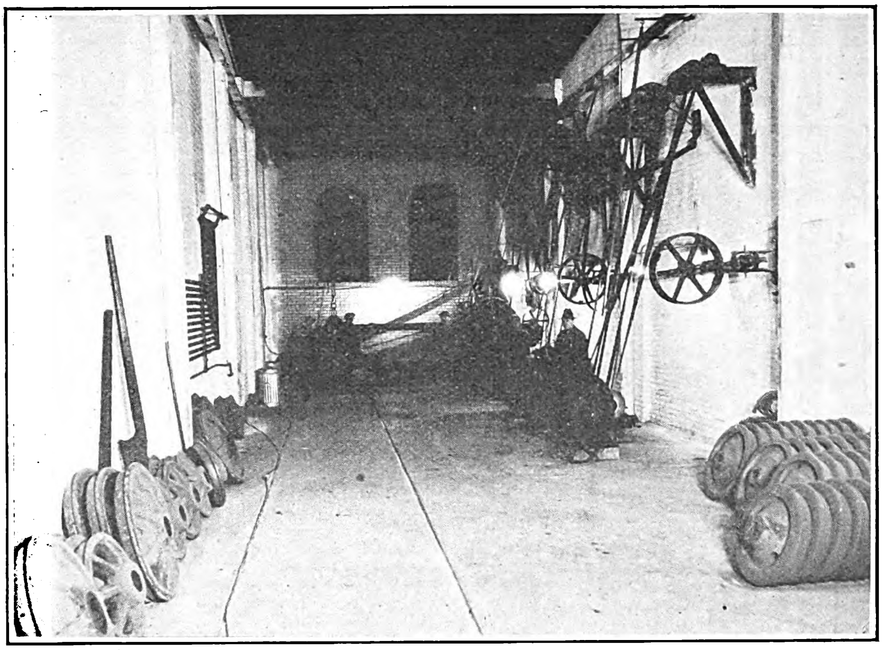
In order to make certain that these important points are not left to the individual judgment of the inspector, special fixtures have been provided at the controller overhauling bench in the shops of the Third Avenue Railway, New York City, for testing and inspecting controller drums after they have been repaired. Of the two fixtures illustrated the one in the foreground shows the construction and the one directly back of it has a controller drum in position for testing and inspecting.

The central part of the fixture consists of a cylindrical casting which is turned accurately on the inside to a diameter corresponding to the outside diameter of the segments. End-bearing supports are provided so that the controller drum can be placed in position and rotated on its own bearings. As the cylinder is rotated any unevenness or misalignment of the contact segments is apparent at once. If the segments are too high they bind on the fixture, and if too low excessive clearance at the edges of the fixture results. The two edges of this semi-circular casting have notches corresponding to the positions that the various contacts should occupy along the length of the drum. Any segments out of alignment or in improper position are indicated as the drum is rotated. A pawl fits in the notches of the controller star wheel, so that as the drum is rotated the edge of the segment should line up with certain projections on the cylindrical casting. By this means the ends of the contact segments can thus be adjusted accurately, so that when the drum is installed in the controller they will function properly. The opposite end of the fixture has a stop arrangement which makes contacts with the stop on the controller drum. The back edges of the segments are lined up by means of this stop to a position which prevents over-running or improper position of the fingers when the drum is in the full series or full parallel running positions. This fixture has proved a great time saver in making accurate inspections and adjustments.


Fixtures for Inspecting Controller Drums Insure Accurate Adjustment

Special Wheel Shop in Dayton

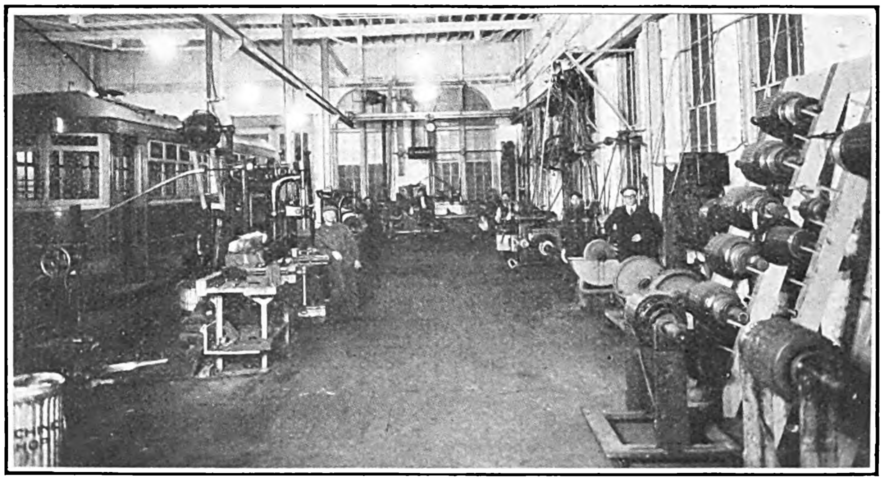
ALL wheel work of the City Railway of Dayton, Ohio, is done at the company's shop in a room that is set aside for this purpose exclusively. As the amount of this work is insufficient to keep the various machines busy continuously, the arrangement adopted enables wheels to accumulate as they are taken off the cars or axles until there is enough work on hand to allow it to be done efficiently. By setting aside a special room for this work the machine shop is kept clear of accumulated wheels.


A Special Room Is Set Aside by the Dayton City Railway for Doing All Wheel Work Except Turning

Included in the machine equipment is a hydraulic press, a boring mill and a grinder. The shop management considers that the amount of wheel turning to be done does not justify the expense of a special wheel lathe. Consequently a large engine lathe is used both for wheel turning and for other work. Due to this arrangement, the turning is done in the general machine shop and not in the special wheel room.

In the wheel room a small overhead hand-operated crane serves the various machines and expedites handling of the wheels both before and after mounting on axles. The wheel grinder is used to true up the treads and flanges before they become so badly worn as to require turning. In this way considerable additional mileage is obtained and expensive turning is frequently avoided.

A small emery grinder is also included in the wheel room for sharpening tools and for other miscellaneous purposes. The accompanying views of the general machine shop illustrates the neat appearance and saving in room that is obtained by keeping the shop free of bulky wheels and machinery.


By Keeping the General Machine Shop Clear of Accumulated Wheels, a Ship-Shape Appearance Is Maintained and at the Same Time There Is More Room Available for Other Work

New Equipment Available

Automatic Welder

FOLLOWING several years of development and trial, the General Electric Company, Schenectady, N. Y., is now marketing a line of automatic arc-welding equipments. Heretofore, it has been the custom to supply the separate parts only.

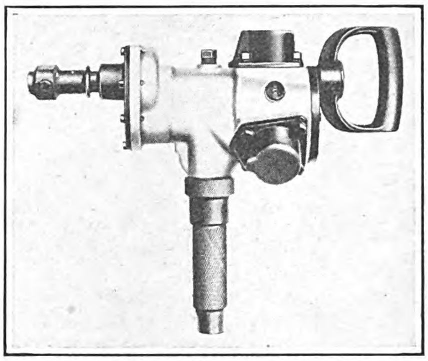
The new outfit is expected to find its principal application in the construction of standard products, repairing undersize shafts or axles and building up sharp flanges on car wheels.

Speed of production, according to General Electric engineers, is especially marked when comparison is made between the automatic arc welder and either hand arc welding or hand gas welding. A complete outfit can be operated by a man and helper, while the completion of an equal amount of hand work in the same time would necessitate the use of four or more men. Estimates also indicate a lower overhead expense than with gas welding, excluding the item of labor. The use of push-button control provides simplicity and ease in operation. Uniformity of finished product and space saving by the reduction of the number of workers and quantity of stock on hand are among the other advantages claimed for this equipment.

A complete outfit consists of an automatic welding head and control panel, travel carriage and clamping device. Where it is desired, in order to meet special circumstances, the travel carriage and other component parts of the equipment may be assembled by the purchaser with his own device for holding the work in position.

Pneumatic Drill

SIZE DD of the line of light-weight reversible pneumatic wood-boring machines has been brought out by the Ingersoll-Rand Company, New York, N. Y. This drill is suitable for boring holes up to 1 in. diameter. Features of this machine include a three-cylinder motor, light-weight aluminum case, steel bushings cast in place in all the bearing holes, renewable crankpin sleeves and renewable cast-iron cylinders.



Pneumatic Wood-Boring Machine

The rotating parts of the motor are all accurately balanced to eliminate vibration and wear. The new size drill has an average working speed of 705 r.p.m. It weighs 15 lb., including a spade grip handle and bit chuck, which are furnished as standard with this type drill. A breastplate or feed screw can be substituted in place of the grip handle when so desired, and a drill chuck in place of the bit chuck, so as to make the drill adaptable to a wider variety of work.

Crawling Tractor Crane

AN IMPROVED 10-ton crawling tractor crane has just been developed by the Industrial Works, Bay City, Mich. This new type is similar in outward appearance to former types, but the design embodies new engineering features, such as split gears for propelling, double clutch mechanism, long tractor belts and increased speed.

The system of split gears provides for controlling each tractor belt separately. Two concentric vertical propelling shafts at the axis of revolution lead to two independent but concentric trains of spur and bevel gears, each operating one tractor belt. Each belt is directly controlled by two powerful friction clutches and brakes in the revolving upper works, which give independent, definite and easy control over each belt while propelling. An all-gear drive from the engine to the sprockets with no chains in the mechanism is thus provided. Maneuvering the tractor in close quarters becomes comparatively simple through the use of the friction clutch and hand brake for each tractor belt. The provision for steering and propelling by friction clutches is an exclusive feature of this design.

The center distance between the two end sprockets is 10 ft. This long tractor belt gives increased stability for wide range of operation. Separate levers are provided for operating each function of the crane. These are placed on the operator's platform in the revolving upper works convenient to the operator. Particular attention has been given to the combining of strength with light weight and to making parts accessible so that they can be maintained easily. All speeds have been increased 25 per cent over those of previous cranes manufactured by the company. The increase in speed should produce corresponding savings in time and cost.

The crane is constructed so that it may be operated by either a steam engine, electric motor, gasoline motor, or fuel oil engine of the Diesel type. It is readily convertible into a shovel or pile driver, and any equipment intended for operation on a boom can be applied, such as clamshell or dragline bucket, electromagnet, or hook and block for grappling.

Loading a Dump Car with the New Tractor Crane

Association News & Discussions

Master Mechanics Discuss Freight Equipment Interchange

SOME 40 members of the new Central Electric Railway Master Mechanics' Association met at Fort Wayne, Ind., for their first regular meeting following the organization of their association. President T. H. Nicholl presided. In accordance with the previously arranged program, the meeting was devoted almost entirely to a discussion of problems connected with the interchange of freight equipment.

E. B. Gunn of the Western Ohio Railway, acting as a committee of one, invited a steam railroad mechanical executive of long experience to take part in the meeting for the purpose of explaining steam railroad practice in the use of inspection cards for interchange equipment under the American Railway Association rules. This practice was compared in detail with that of the electric lines in the C.E.R.A. territory, and it quickly became evident that the meeting was of immense value in clearing up a number of questions regarding the proper use of the various inspection cards. It was the consensus of opinion that the committee on interchange rules would probably continue to function as a standing committee, not only to prepare such revisions of the rules as become necessary from time to time, but also to serve in the capacity of an advisory body on their application and interpretation.

A report of the committee on grab handles was presented by Chairman A. W. Redderson. The committee had prepared a drawing showing the suggested location of all grab handles and related apparatus at the ends of freight cars. This was discussed in some detail. It was decided that each member would be given an opportunity of comparing the suggested standard arrangement with the conditions on his own property and equipment. While the proposed arrangement of grab handles varies somewhat from steam road practice, the provisions of the federal safety appliance act were carefully checked with the proposed standards, so that the arrangement suggested would come within the provisions of the law.

Several slight changes in the constitution of the association were adopted. The membership was broadened to include three grades—active, associate and honorary. Active membership is open to all men in charge of mechanical department work on lines that are members of the C.E.R.A., and to their principal assistants. Not more than two men can be active members from any one property. Other mechanical men in the territory, and mechanical men from properties not members of the C.E.R.A. are eligible to associate membership. These have all the privileges of active members except the right to vote or to hold office. Honorary members, as before, are elected from engineers in the industry, when proposed by five active members.

The delegates to the meeting were guests at luncheon of the Indiana Service Corporation. In the afternoon an inspection trip was made to the repair shops in Fort Wayne, and to the shop site and newly completed carhouse of the local company.

In accordance with the new constitution, there will be three regular meetings of the association per year. These will be held on the second Thursday of February, May and September. It was decided to hold a special meeting on one afternoon during the C.E.R.A. summer meeting at French Lick, and the next regular meeting at Anderson, Ind., on Sept. 10.

N. F. P. A. Meets in Chicago

THE National Fire Protective Association will meet at the Congress Hotel in Chicago on May 12-14. At this time the proposed new code for car and carhouse wiring, which has been studied by that association in co-operation with a special committee of the American Electric Railway Engineering Association, will come up for adoption.

Annual Meeting of New York Association

THE New York Electric Railway Association, whose annual meeting will be held at Bluff Point, N. Y., announces that the management of Hotel Champlain has agreed to make a rate during the meeting of $10 per day, per person, including meals and the banquet. This year the New York State meeting will extend over two days, Friday and Saturday, June 26 and 27.

Buses Needed at C.E.R.A. Meeting

THE committee on transportation for the coming meeting of the Central Electric Railway Association to be held at French Lick Springs, Ind., on June 2-4 is endeavoring to provide buses to carry delegates from Indianapolis or from some point on the Interstate Public Service Company's lines to French Lick. Since bus manufacturers will probably plan to have sample equipments at French Lick for the inspection of those in attendance, the committee will welcome the use of these buses to assist in transporting the delegates to the meeting. Manufacturers who desire to place one or more vehicles at the disposal of the committee should communicate as soon as possible with the chairman, L. M. Brown, general superintendent Interstate Public Service Company, J. F. Wild Building, Indianapolis, Ind.

American Association News

American Executive Committee

THE executive committee of the American Electric Railway Association held a regular meeting at association headquarters in New York on April 14. Executive Secretary J. W. Welsh gave a statistical report of the activities of the association for the year 1924 and a statement of revenues and expenses of the association for the first five months of this year. Expenditures made in connection with the new headquarters of the association were comparatively slight, as most of them had been made by the owners of the building. Mr. Stevens reported that a lease for the offices for the Advisory Council on the twelfth floor of the same building had been approved.

For the committee on national relations Mr. Henry stated that the question of determining the scope of the amended transportation act of 1924 in so far as it applies to electric railways had been considered carefully. Electric locomotives used in interstate commerce would be subject to the act, according to the opinion of the committee's legal adviser. Electric motor cars, on the contrary, were not considered to be under the act. Mr. Henry stated that it was impossible to put the report of this committee in shape for final action at this meeting of the executive committee.

Mr. Storrs reported on the regulation of motor buses in interstate traffic, which has become desirable on account of the recent action of the United States Supreme Court. He asked for suggestions on proposed legislation. A general discussion followed the presentation of Mr. Storrs' report, in which it was brought out that this situation is the most serious one that has come up before the association in recent years. A motion was adopted to the effect that the entire matter be left in the hands of the committee on national relations.

Considerable discussion took place on proposed changes in the constitution and by-laws as given in the report of a special committee and presented by C. R. Ellicott. A number of suggestions were made and the subject was referred back to the committee for further study.

Mr. Storrs stated that with regard to the Hoover Safety Conference the

American Electric Railway Association has gone forward with the idea proposed by Secretary Hoover. It is the only association that has actively furthered the work up to the present time.

For the committee on company and associate membership Mr. Palmer stated that there had been a gain of four company members since the last executive committee meeting.

The association appropriated a sum of $250 for an exhibit before the Associated Advertising Clubs of the World at its meeting to be held in Houston, Tex., this spring.

Speaking for the committee on arrangements for the Midyear Dinner, Mr. Hanna stated that the net number of tickets sold was 659. Out of the receipts it was possible to pay all bills and leave a surplus of $65.

There was a net gain of twelve individual members, according to Mr. Morgan, chairman of the committee on company section and individual membership. The executive committee approved Mr. Morgan's viewpoint that in the case of a holding company with a number of subsidiaries the subsidiary having the largest receipts should be the one selected for membership in the association, provided a number of such companies were not to be included.

Executive Secretary Welsh read the report of the exhibit committee for Chairman Morgan. The rate for space at the coming convention has been fixed at 65 cents per square foot, the same as at the last two conventions. The association has the permission of the Atlantic City authorities to place ten street cars on the boardwalk. A track has been laid up to the pier so that the handling charges for street cars will be very much less than in former years. The 65-cent rate for space was approved.

A resolution was adopted to the effect that the association frown on exhibits at locations outside the pier or at places not designated by the committee on exhibits. A proposal was made for a separate day for the inspection of the exhibits. Upon motion it was recommended that Wednesday, Oct. 7, be set aside for this purpose.

A form of uniform bill for adoption by state legislatures to promote highway and crossing safety was read by Mr. Briggs. This was designed to cover uniformity in legislation so that there would not be confusion and ambiguity as to the procedure to be followed by motorists. The matter was referred for action to the representatives of the association on the conference on street and highway safety of the National Safety Council.

A contribution to the conference on street and highway safety was ordered by the executive committee. A resolution from the Transportation and Traffic Association executive committee was presented to the effect that the former association requested the American Association to refer all matters regarding street and highway traffic to the T. & T. Association.

Invitations were presented by Mr. Coates to all A.E.R.A. members to attend the Central Electric Railway Association convention at French Lick June 2-4, and by Mr. Morgan to attend the New York Electric Railway Association meeting at Bluff Point, N. Y., on June 26-27.

COMING MEETINGS
OF
Electric Railway and Allied Associations

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 26-27—Regional Motor Transport Conference, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

It was moved and seconded that the next meeting of the executive committee be held at the Windsor Hotel, Montreal, Canada, on June 10. This date was selected on account of the convention of the Canadian Electric Railway Association, which had sent an invitation to the American Association to hold its next executive committee meeting in connection with that event.

Members present were President J. N. Shannahan, F. R. Coates, L. S. Storrs, R. P. Stevens, J. W. Welsh, H. D. Briggs, Paul Shoup, L. H. Palmer, J. H. Hanna, H. B. Flowers, E. F. Wickwire, Harry Reid, C. E. Morgan, E. P. Waller, G. H. Harries, C. L. Henry, R. I. Todd, Myles Lambert for H. D. Shute, and E. C. Faber for Barron Collier.

Claims Executive Committee

A MEETING of the executive committee of the American Electric Railway Claims Association was held at the association office, New York, on April 15. Those in attendance were H. D. Briggs of Newark, N. J.; J. S. Kubu of Cleveland; F. G. Herrell of Knoxville, Tenn.; and George Lorenz of Chicago. Mr. Lorenz represented G. B. Hellmuth, and Dr. Hart represented E. Fisher, members of the executive committee. The principal work done was to go over the program for the year and the assignments of the different committees. Other topics considered were the marking of car steps with the words "Watch Your Step," and various methods of resuscitation.

Use the Association Facilities

CIRCULAR letters have been sent out from association headquarters to all members and also to executives of non-member companies outlining briefly the various activities of the American Electric Railway Association and the services it renders to its members.

During the year 1924 some 13,300 requests for information were made of the association. A large share of these required a considerable amount of work for answer. "Too often," says Executive Secretary J. W. Welsh in his letter of transmittal, "some members avail themselves of our services only when they are in serious trouble. Of course, we are glad to oblige and do our best. The crisis passed, all too frequently they forget us. We send them regular announcements of the material and information at hand, but hear little from them again unless such an emergency arises. If one does, they come back. And every time they return and look us over they express surprise at the amount of help we can give them. Such members use us merely as an emergency truck in trouble."

The desire of the association, as stated in the letter, is to get all members to use the services of the association as a supply car. In this way it is possible to draw on the suggestions of many of the 500,000 workers who are engaged directly or indirectly in the electric railway industry.

Special Reports Available

THE following special reports have been prepared and are available to member companies in good standing upon request:

Bulletin No. 16—Working conditions of electric railway trainmen—This gives data for more than 200 companies on hours of labor, length and types of run, overtime rates, extra compensation allowed for special work, labor turnover, vacations allowed and other miscellaneous factors affecting working conditions.

Bulletin No. 17—State Regulation of Motor Bus Common Carriers—Contains copies of all state laws providing for the general regulation of motor bus common carriers, together with copies of rules and regulations for motor bus operators prescribed by state commissions under the laws. The compilation is preceded by an analytical index and digest giving ready reference to particular sections and listing states that have legislated on the various subjects. Special tax legislation is not included except where it is a part of a general regulatory act. All taxation measures and other miscellaneous acts affecting motor bus operations in any way will be summarized and indexed in a later compilation.

Bulletin No. 18—Rate of Return Allowed Electric Railways—Extracts from decisions of public utility commissions in which the rate has been fixed after an official determination of the amount upon which the company is entitled to earn a return.

Bulletin No. 19—Motor Bus Operations in the United States, Part IV—This is the fourth installment of a list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operators and where the information is available, statistical data on the character of their operations. The present installment cover the states of Illinois, Pennsylvania and South Dakota.

In addition to the above supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies (Bulletin No. 20) have also been prepared, bringing them down to date.

The News of the Industry

Detroit May Proceed Alone

Rapid Transit Plan May Be Confined to City, with Near-by Towns Coming in Later

A resolution providing that the Rapid Transit Commission of Detroit, Mich., submit to the City Council its plan of routes to include Detroit only has been prepared by P. J. M. Hally, attorney for the commission, and placed in the hands of John C. Lodge, president of the Council. For the present any route into or through the surrounding municipalities will be eliminated. The commission has pledged itself to submit its plan of routes for the city to the electors of Detroit at the first opportunity.

The resolution was drafted after the commission became exasperated by the various obstacles placed in the way of passage of its bill and after Governor Groesbeck had expressed doubt as to the constitutionality of the bill presented to the State Legislature. The Greater Detroit program is given up and a plan for city lines only is to be considered now.

It is cited by the commission that it is now possible for Detroit to proceed within its own limits and postpone for the time being any consideration of the surrounding municipalities. It is realized that the congested condition on certain downtown thoroughfares constantly grows worse and that the situation may not be remedied by any other means than rapid transit, if the city's growth is not to be retarded.

The passing of the resolution by the City Council will make it imperative for the Rapid Transit Commission to remodel its plan, which contemplated routes serving Highland Park and Hamtramck as well as in Detroit.

Highland Park and Springwells are the homes of the Ford industries and Hamtramck is the home of the Dodge Brothers' plant, so to leave out these two municipalities will necessitate a change in the rapid transit plan.

Members of the commission expressed the belief that Detroit could build itself a system of elevateds and subways under the 1923 legislation or under the financial plan approved last fall in a charter amendment. The 1923 legislation contained the so-called Nagel plan of financing, which provided that the city authorities could set aside any value found to accrue to property by reason of a subway in a separate column and tax this valuation only for subway purposes at the regular tax rate. The latter plan provides for splitting the cost of rapid transit lines so that 19 per cent would be raised by a tax on the city at large, 51 per cent by assessments on real estate in benefited zones and 30 per cent through fares.

At the State Capitol the original bill sponsored by the Detroit Rapid Transit Commission has been pigeonholed. This measure provided for the spending of $200,000,000 for the construction of about 40 miles of subways, elevated or surface rapid transit lines. The Wayne County delegation to the Legislature fixed $60,000,000 as the limit that may be expended in the construction of the proposed rapid transit system without again petitioning the Legislature for revision of the financial limitations.

A substitute bill has been proposed which it is reported has been agreed to by various Detroit commercial organizations. This bill, it is understood, contemplates making $54,000,000 available from bond issues and $4,500,000 annually by direct taxation, leaving the question of limitation of special property assessment to the discretion of the City Council.

A new bill sponsored by the Governor would tend to set aside the plans of the Rapid Transit Commission in so far as changes in the existing state laws are concerned. It would necessitate the Council submitting charter amendments on which detailed plans of the commission could be based. When approved by the voters, the amendments would then have to be submitted at a separate election to obtain the adoption of the plan proper. The purpose is to let the people of Detroit decide just how they want the proposed rapid transit system built and financed and who shall take charge of the work.

Peace in Philadelphia

Mr. Mitten Still Opposed to Conowingo Power Plans, but Withdraws from Effort to Secure Control of Philadelphia Electric Company

THOMAS E. MITTEN, chairman of the executive committee of the Philadelphia Rapid Transit Company, Philadelphia, Pa., remains the implacable foe of Conowingo. That is the sum and substance of the recent battle between Mr. Mitten and the Philadelphia Electric Company which kept the City of Brotherly Love stirred up for several weeks. But sum and substance are not all. There were lively times in Philadelphia while the controversy raged—times too lively to be dismissed with a single sentence.

Conowingo, it should be explained, is the $52,000,000 development proposed to be carried out in the interest of the Philadelphia Electric Company in anticipation of its future power needs. P. R. T. lined up against the Conowingo project because "it is purely and simply a banker's project for the sale of securities." As the *Public Ledger* phrased it, P. R. T. contended that Conowingo was "forced upon P. E. by the Drexel interests for their own profit and for the profit of the engineers who are to build it, if it shall be authorized, upon terms which involve no risk to themselves and all to the P. E." As that paper saw it, "P. R. T., as the largest customer of P. E., undoubtedly has a vital interest in the question it has raised."

The railway did not mince words. Neither did the Philadelphia Electric Company for that matter. The language of the latter was, perhaps, more reserved, but it was no less telling than was that of the railway. Mr. Mitten said that "the present controversy is a contest between the old order and the new." He was not opposed to the development of water power, but he was opposed "to the development of any water-power project for the benefit of bankers and promoters." "The rule for the rich," said Mr. Mitten's spokesman, "must be the same as for the poor." The Drexels—meaning Drexel & Company, the bankers—dominate P. E. by virtue of P. E. stockholders' proxies, charged Mr. Mitten.

But Mr. Mitten went farther than that. In a plea for proxies he offered P. E. stockholders P. R. T. management, with the assurance of an additional 2 per cent upon P. E. common stock—an increase in the dividend from 8 per cent to 10 per cent. It was a direct appeal to the pocketbook. The annual meeting of the Philadelphia Electric was at hand. Big doings loomed ahead. It was, indeed, an unusual situation, this impending battle for control. Innuendoes were hurled about with reckless abandon, as they say.

For a while P. E. remained quiet. Then it, too, entered the fray. It said that every thoughtful citizen should resist "the Mitten attempt to grab control of the Philadelphia Electric Company for selfish and ulterior reasons." Yes! Those were the exact words. To illustrate "the absurdity" of the Mitten proposition, it said that if "P. R. T. got current from P. E. entirely free it would make a difference of only one-quarter of 1 cent per passenger carried in 1924, against the lowest fare of 7½ cents, which would have no practicable effect upon trolley fares in Philadelphia." Moreover, it indicated that the yearly increase in business to it from sources other than the railway was greater than the total of business by the P. R. T. from the P. E. Mr. Mitten's yearly consumption of power, if withdrawn, would not hurt P. E. much, anyhow. Moreover, P. E. sought to show that whereas it had reduced rates the tendency of fares on the lines of the Philadelphia Rapid Transit had been upward. It also printed a comparison from Moody's to show the difference in the margin of safety between P. E. securities and P. R. T. securities.

The fat certainly was in the fire. Meanwhile, the local papers took a hand. The *North American* discovered that the New York State Public Service Commission had declined to allow the Buffalo system to charge up to expenses the fees it pays Mitten management. The *North American* even suggested that the Pennsylvania commission "ascertain how much the Buffalo activities cost the P. R. T. in the way of time and energy expended by Mitten Management, Inc., for which the P. R. T. is paying more than $300,000 a year."

If Mr. Mitten could appeal to P. E. stockholders, W. H. Johnson, president of the P. E., could certainly appeal to his own partners in the electric company. And he did. Mr. Johnson's advice to the stockholders of his company was "to consider well a proposition to put power into the hands of those who are publicly attacking your company to promote their selfish interests."

And so the battle went into its final stages. It was exhaustive and exhausting. Necessarily, this is the barest outline of it. It all ended on the night of April 5 in this letter addressed by Mr. Mitten to the chairman and the president of the Philadelphia Electric Company:

> You are hereby respectfully informed that the campaign of this management to secure the proxies of the stockholders of your company has been this day discontinued and that the proxies thus far secured will not be voted in opposition to your management at your annual meeting.
>
> Your more than 20,000 small stockholders were so impressed with your published assurances that you were still in control that they, over and over again, expressed a willingness to lose all that they had invested in your company, if that should be the outcome, in order to stand by you in response to your call.
>
> This management having itself survived with its own company against the opposition of its bankers only a few years ago, through the rallying of its own employees and stockholders—much as your employees and stockholders are now rallying to you—fully appreciates the honor tendered you in recognition of past service, as well as the greatly added responsibility which now rests upon you.
>
> This management hopes most sincerely that the result of this contest will make you dominant in the affairs of your company and enable you to adequately protect the interests of those stockholders who have so signally expressed their confidence in you.
>
> NOTE—P. R. T. must continue its fight against the Conowingo power project—for reasons already given to the commission.

And so finis was written to the matter except for the fact that "P. R. T. must continue its fight against the Conowingo power project—for reasons already given to the commission."

Mr. Johnson's only comment for publication was that "Mr. Mitten's letter is as broadminded as it was unexpected. These two managements have always worked in harmony in the past and it is my hope that they will continue to do so in the future."

At which Philadelphia breathed a sigh of temporary relief.

1,120 Tickets Sold Under Youngstown Plan

The weekly ticket plan making possible the 5-cent fare on the lines of the Youngstown Municipal Railway, Youngstown, Ohio, will be continued for another week. During the first trial week Harry Engle, local street railway commissioner, reports that 1,120 tickets were sold. Mr. Engle has interpreted this to mean that only the few persons who use the cars regularly four or more times a day bought tickets.

Chicago Matters Before State

Traction Issue Likely to Be Before Legislature—New Co-ordination Proposals Outlined

A flood of legislation is the aftermath of the Chicago municipal traction defeat. City officials and campaigners scattered to resorts and the whole question was taken up by the mass of state Assemblymen, of whom there are twice as many in Chicago as Aldermen. Springfield, the state capital, henceforth will probably be the scene of many hot traction battles.

Henry A. Blair, head of the Chicago Surface Lines, arriving home ten days after the election from a trip, found his co-ordination, service-at-cost plan the leading one before the citizens, but its fruition dependent upon an amendment to permit a new type of franchise to utilities. This gives Governor Small the whiphand in future.

The Blair plan is rivaled by one of Samuel Insull, head of the elevated lines, but Mr. Insull did not go so far in co-ordination and other provisions highly desired by the city. Both plans are dependent upon co-operation between the two men who drew them.

The Blair plan:

> An indeterminate, or "terminable," franchise subject to "good behavior," or a twenty-year franchise to which additional periods can be added every ten years after the franchise has run half its life.
>
> As much subway as can be built with the $40,000,000 the city has received from the surface lines under the present franchise.
>
> Unified operation of surface and elevated.
>
> Auxiliary bus service.
>
> Extensions to double present carrying capacity.
>
> Rapid transit to every part of city.
>
> Service at cost.
>
> One fare with universal transfers.
>
> Provision for city purchase by direct payment or amortization.

"It should be possible," says Mr. Blair, "for a citizen to board a street car in front of his house, transfer to a rapid transit train and enter the business district through a subway, all for one fare."

The plan calls for $105,000,000 expenditure in six years and a system capable of carrying 2,000,000,000 revenue passengers a year.

This and other plans will come before the reorganized City Council under an order by Mayor Dever when his plan was defeated. He said it was evident that the people did not desire what he had to offer and it was now their turn to show what they wanted.

That the result of the election was a decided compliment to the Chicago Surface Lines and the elevated roads is conceded. Throughout the campaign speakers called the surface lines the best plant in the United States and a bargain at $163,000,000. Clean, well painted, fast running cars, company supervisors at all important points helping passengers and traffic and general good feeling between citizens and company served to bear this out.

Union at Cleveland Wants 18-Cent Increase

The car men's union at Cleveland, Ohio, has voted to demand a wage scale of 73 cents an hour for the first three months of service, 75 cents an hour for the next nine months and 78 cents an hour for all men in service more than one year. Their present wage scale is 55, 57 and 60 cents.

The men insist that their demand, to be presented to the Cleveland Railway before May 1, is really an increase of only 6 cents an hour, inasmuch as a board of arbitration last June granted them an increase of 12 cents an hour. This award of the board, however, has been rejected as illegal by both the Common Pleas Court and the Court of Appeals in Cleveland. The men are now attempting to have the case heard in the State Supreme Court.

The company's viewpoint is that the men are really asking an increase of 18 cents, inasmuch as the award of a year ago was illegal and the men have never received it. John J. Stanley, president of the company, has indicated his willingness to give the men an increase of 5 cents an hour.

If the State Supreme Court sustains the verdict of the Court of Appeals, not only will the union not get the 12 cents an hour awarded a year ago, but no new agreement will be entered into between the company and the union, inasmuch as the Court of Appeals has held that the closed shop provision in the original contract makes a proposal of this kind null and void on the ground of public policy.

So far the men have not formally presented their new demands to the company and it is not likely they will do so until the State Supreme Court has decided whether or not it will hear their appeal from the decision of the Court of Appeals.

Third Avenue Railway Joins New York Bus Bidders

The bus franchise application of the Third Avenue Railway, New York, asking for 26 Manhattan and Bronx routes to be operated at 5 and 10 cent fares, was delayed in reaching the office of the franchise bureau of the Board of Estimate. It was made public on April 10, bringing the number of applications filed up to 27.

The Third Avenue Railway and the New York Railways are the only two traction companies to bid for a franchise for routes proposed by the Municipal Board of Transportation. Neither the Interborough Rapid Transit Company nor the B.-M. T. renewed its application. These companies were conspicuous contenders for the franchises up to the time Mayor Hylan scrapped all applications and called for new ones along the lines laid down by the city board.

The Third Avenue Railway proposes a fee to the city of 2 per cent of the annual gross receipts and a guaranty of $25,000. It intends to operate within two months from the date of granting the franchise. The Surface Transportation Corporation, the bus subsidiary, will be run by the operating departments of the Third Avenue Railway.

New Buffalo Fare Probably Insufficient

The 8-cent fare recently authorized by the Public Service Commission is insufficient and a still greater increase is needed if the International Railway, Buffalo, N. Y., is to undertake track and rolling stock improvements. Herbert G. Tulley, president of the railway, has so informed the commission and the municipal authorities. The commission a month ago allowed the company to increase its fare from 7 to 8 cents. It now is reported the company wants a 10-cent fare on all local lines. Mr. Tulley said:

> The International avers that its income under the present rate of fare is sufficient to meet only the bare operating costs of its property. The imposition of any additional track, roadbed, rail or paving costs without a corresponding increase in the rates of fare would work a financial burden which would be impossible for the company to carry.

A conference attended by representatives of the municipality, the Public Service Commission and of Mitten Management, Inc., which has the contract for the operation of local and interurban lines of the International, was held in Buffalo on April 15. It was called by the commission to discuss the report covering traction service recently made by the commission following an investigation by engineers of the utilities board. The report was not made public prior to the conference.

Traction representatives at the conference included Thomas E. Mitten, chairman of the board; J. A. Queeney, vice-president of Mitten Management, Inc., and Nelson Robinson, New York.

Minnesota Commission Will Hear Bus Application in May

Passed by the Legislature, a bill awaits only the Governor's signature to put Minnesota's bus lines under control of the State Railroad and Warehouse Commission. I. D. Bowen has been named by the commission to direct administration of the new department.

The law requires every bus line, of which there are some 50 with 600 buses, to take out a license to operate each route. The commission will establish routes and rates of fare, and with each application the bus company must show the public necessity and the convenience before the license can be granted. In fixing the rate of fare and routes the commission must consider the effect of the service on the railroads and prevent duplication of service as far as possible. Parties under the law are the companies, local government units, railroads and the public. The decisions of the commission are subject to appeal to the courts. This law places the subject of jitney buses under control of the state instead of the city councils.

Under the new law the Twin City Motor Bus Company, owned by the Minneapolis Street Railway, must have licenses for its lines between Minneapolis and St. Paul, between St. Paul and Stillwater, Minn., St. Paul and White Bear, Minn., and between the Lake Minnetonka station at Glen Lake and the Glen Lake Sanitarium. Prospective lines ordered by the City Council of Minneapolis at the ends of various trolley lines must be approved by the commission.

Until the permanent rate of fare matter is settled by the State Railroad and Warehouse Commission the Twin City Rapid Transit Company cannot complete its plan of still further improving the Twin Cities system.

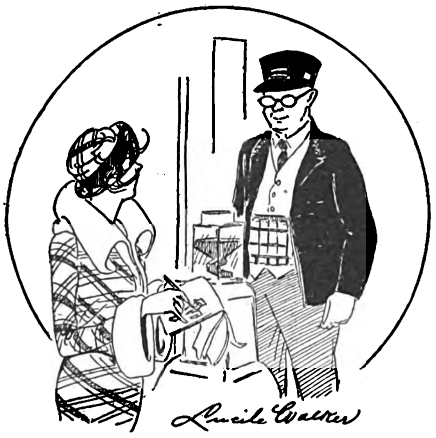
The Railroad and Warehouse Commission will have its first hearing on bus line operations early in May.

Horace Lowry, president of the Twin City Rapid Transit Company, said:

> The attitude and relationship of the street railway are not changed by the passage of the bus bill. Our position is the same as it has been in the past. We shall continue to try, with the city, to work out such plans as conditions may make practical and desirable from the standpoint of public service. Our duty and our interest lie with the city and the bus law will only impose a change in the legal formalities and not in the essence of relationship with the city. When plans for bus extensions or inaugurations have been worked out that are satisfactory to the city and when we have the approval of the city, we will then apply to the State Railroad and Warehouse Commission under the terms of the law.

Denver After Coffin Award

Denver versus Dallas. That is the lineup. It is a competition, and Denver makes no bones of the fact that it is going to be keen. The object—the Coffin prize. Jimmie Adams, the genial superintendent of transportation of the Denver Tramway, has started a campaign that is getting into the papers, just as did the recent one in Dallas. For instance, on April 7, the Denver *Times* had a feature by one of Denver's best, cutest and slangiest little reporters. The subject was Miss Pitcaithly, about whom the ELECTRIC RAILWAY JOURNAL had a story recently. The Denver team is reported to be running strong with the batting average high and errors reduced to a minimum. In a folder issued recently the Coffin prize committee of the Denver Tramway said:



Lucile of Denver "Times" Talks to Conductor

> Fort Worth captured the prize for 1924. Now every Fort Worth citizen is an enthusiastic booster for the boys of the Northern Texas Traction Company.
>
> "We've got the best street railway in the United States," is the proud boast of the car riders of Fort Worth.
>
> Let's make 'em add "except Denver!" to their boasting.
>
> The American Electric Railway Association, through which the prize is awarded, will name the 1925 winner next October, during its annual convention.
>
> Let's get ready to pour those 1,000 dollars into the employees' fund. Let's push out our chests and make ready to wear that gold medal on them.

Wage Arbitration on in Providence

A board of arbitration is hearing the controversy between the United Electric Railways, Providence, R. I., and the union employees relative to wages and working conditions. Arthur Sturgis, statistician for the local street car men's union, testified on March 31 that the wages in Providence should be from 65 cents an hour to 70 cents an hour instead of the present 61-cent scale. He contended that wages in 1925 should be determined by the difference in cost of living between 1918 and 1925. James H. Vahey, counsel for the union, suggested limiting the testimony to three days. Both the company and the union have been preparing their cases since the agreement to arbitrate was signed on Feb. 5. The arbitrators include James H. Higgins, chosen by the union; Frank H. Swan, chosen by the company, and Prof. James P. Adams of Brown University chairman. The questions before the board include increase in wages, change in basic working day and abolishment of seniority.

Memphis Men Accept Existing Scale

Union employees of the Memphis Street Railway, Memphis, Tenn., have voted to abandon a 9-cent wage increase demand and stand by the existing wage scale. This action on the part of the employees automatically killed the company's demand for a 12-cent-an-hour decrease in the men's pay. The affairs of adjustment had been placed in the hands of Mayor Paine, who had been assured by railway officials that if the men would withdraw their demands for an increase the company would give up its stand for a decrease. A new contract will be drawn up effective April 1. The trainmen's wages are 45 cents an hour for the men who have been employed for one year or less, 50 cents an hour for men employed between one and two years and 55 cents an hour for men whose service extends beyond the two-year period.

Court Approves Service Changes

With the approval of the recommendations of George H. Clifford of Fort Worth for the rehabilitation of the Oklahoma Railway, Oklahoma City, Okla., by increased and improved service, given recently by John H. Cotteral, United States Judge, all preliminaries to a complete tryout of the Clifford plan have been approved. The court holds that contracts entered into by the railway requiring that the terminal station be maintained are binding, but that it is not required that all cars operate through the station. Under this ruling the receivers plan to reroute cars, which, by not passing through the station, can contribute most to the economy program. The plan contemplates more frequent service on numerous lines and the installation of bus lines to provide cross-town service and reach certain sections not now served. The feeling among citizens generally is that a few months will see the local railway restored.

Recent Bus Developments

Many Items of Interest Reflecting the Increased Use of the Bus by the Electric Railways—Several Important Purchases—More Motor Lines in Detroit

OFFICIALS of the Duluth Street Railway, Duluth, Minn., announce the purchase of the interstate buses operating between Duluth and Superior. The purchaser is the Duluth-Superior Coach Company, a subsidiary of the railway. The buses were bought from the Northland Transportation Company, Duluth, which purchased them from the Superior White Company during the previous week. The Ashland line, also purchased by the Northland Transportation Company from the Superior White Company at the same time, was not involved in the sale to the Duluth Street Railway.

O. S. Caeser, an official of the Duluth-Superior Coach Company, recently stated that the purpose of the purchase was to provide a reliable and extra special through service between the cities of Duluth and Superior. He said that no local passengers would be carried in either city and that the present cash fare of 25 cents on the buses would not be increased; that present buses would be replaced as soon as possible with modern parlor car type coaches and a de luxe service would be maintained between the two cities.

Herbert Warren, vice-president and general manager of the Duluth Street Railway, announced that the purchase of the bus interests by the traction company was another step by the street railway in its policy to meet fully the needs of Duluth and Superior for transportation facilities.

The Atlanta Coach Company, Atlanta, Ga., has been incorporated to take care of the traffic at the Morningside and Virginia Avenues districts of Atlanta, as a supplement to the service rendered by the cars of the Georgia Railway & Power Company. The incorporaters are H. M. Atkinson, P. S. Arkright, C. G. Adsit, W. H. Taylor and F. L. Butler. The line will be owned and operated by the Georgia Railway & Power Company with equipment described elsewhere in this issue.

The Browncroft de luxe bus line, operated by the Rochester Railways Co-ordinate Bus Lines, Inc., subsidiary of the New York State Railways, has reduced its one-way fare from 25 to 15 cents. This line operates Mack-Lang buses of the most improved limousine type. It connects the heart of the city with the exclusive suburban tract of Browncroft. Originally no stops were made between terminals. Recently this was changed so that the buses would take on or discharge passengers anywhere along its route on signal. In departing somewhat from its original plan, the company expects by the reduction in fare to increase the value of the lines as a revenue producer.

Ernest Stenger, receiver of the Denver Tramway, Denver, Col., addressed the Colorado Engineering Council recently, telling why the Bus Transportation Company, a subsidiary of the tramway, was organized. He said:

"I don't know of any other way to avoid stagnation. The greatest danger of public regulation is stagnation. Don't kill initiative. The greatest advantage of buses for transportation is the elasticity they permit as against rail lines. For use as extensions and feeders to the railway lines, buses have the advantage of representing a smaller original outlay and permit easy adjustment to conditions, despite the fact that the cost per seat-mile is virtually double that of the electrically operated street car.

"It is inconceivable, however, that buses could supplant the rail street cars in the congested parts of the city. The buses cannot handle mass transportation as easily and quickly as the street car. In rush hours it would be virtually impossible to handle the crowds with buses, under present conditions."

It was felt by the tramway that bus transportation had developed to such a point that in order to fulfill its duties the tramway should conduct an experiment in bus transportation.

Four separate bus lines to serve summer cottagers along Lake Ontario are embraced in the program of the New York State Railways, announced by James F. Hamilton, president of the company. Three of the lines will connect Rochester with Island Cottage, Grand View Beach and Manitou Beach and the fourth will serve the Irondequoit territory on the eastern side of the city. Applications have been filed with the town officials along the routes and, if granted, service will start by Memorial Day. The Manitou Beach line will provide transportation for cottagers, without facilities since the abandonment of the Rochester & Manitou Beach (electric) Railroad. This proposed route parallels the Ridge Road Bus line, an independent. The Lakeshore Transportation Company, represented by James J. Dadd, has filed petitions for service similar to that asked in the railways' application. No action has been taken on the independent proposal.

The Detroit Department of Street Railways has expanded its bus operation with the addition of two new bus lines, service being extended on Grand River Avenue for a distance of about 3 miles, and another line having been started on Fenkell Avenue. If traffic warrants the new Fenkell line will be so connected as to give a through route from Grand River Avenue to Highland Park. Buses will be run on a ten-minute headway on the Grand River Avenue line with a five-minute schedule during rush hours. If the service does not prove satisfactory to residents the city may negotiate with the Detroit United Railway for the purchase of the company's Grand River Avenue car tracks to Mill Road. It was the intention of the D. U. R. gradually to decrease service and ultimately establish its terminals at Farmington and Redford, if the D. S. R. took over service on Grand River Avenue to Mill Road.

The proposed arrangement with the D. U. R. was interrupted when it went into receivership. The D. S. R. officials want to compare the two services. The extensions are in line with the survey reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 24, page 129.

Governor Smith of New York on April 7 vetoed the Thayer bill which would have brought freight-carrying buses under supervision of the Public Service Commission as common carries and the Clayton bill amending the transportation corporation law providing that stage corporations in all cities shall be deemed common carriers. In vetoing the latter measure the Governor said: "At the present time litigation is pending on the question of the power of the city of New York, under the enabling act construing the home rule amendment to the Constitution, to supersede Sec. 24 of the transportation corporation law. I cannot escape the conclusion that the approval of this bill would operate to defeat the city in its purpose to supersede this section should the courts decide in its favor."

The Wisconsin Power & Light Company, Oshkosh, Wis., has announced the purchase of the business and equipment of the Interurban Rapid Transit Company and the Gallagher Transportation Company, which has been furnishing bus service between Madison and Stevens Point; also the Schlegler Transportation Company, which has been supplying service between Portage and Madison. New equipment will be added to these lines in accordance with the company's policy of providing frequent and dependable bus service.

The Twin City Motor Bus Company, Minneapolis, Minn., has bought land in White Bear, a St. Paul lake suburb, on which to build a bus depot. The Twin City Rapid Transit Company owns the bus line.

The Roanoke Railway & Electric Company, Roanoke, Va., through its subsidiary, the Roanoke Rapid Transit Company, recently began a bus service between Salem and Roanoke. Each bus seats seventeen passengers. The purpose of the company is to provide a form of intercity transportation similar to the private automobile.

Announcement was made recently that the Interstate Public Service Company, operating between Louisville and Indianapolis, had closed a deal with A. G. Harmon, Indianapolis, whereby it acquires all property, franchise and good will of the Jackson Highway Bus Line, known as the J. & H. Bus Line. The bus line was established about four years ago and operates between various points from Indianapolis to Jeffersonville, Ind., opposite Louisville, on the Ohio River. The two companies had been operating competing bus lines over these routes. In the deal the Interstate gets thirteen buses that were in operation, and five de luxe buses, purchased but not delivered. A. G. Harmon becomes associated with the motor bus department of the Interstate. For the present both lines will be continued.

News Notes

More Token Carriers Offered.—The Johnstown Traction Company, Johnstown, Pa., through Lee T. Shannon, general manager, has announced the sale of 5,000 token holders offered patrons recently. Another consignment of 5,000 of the carriers are available on the cars or at the company's offices. For $1 conductors will sell patrons a token carrier and thirteen car checks, making the price of the carrier 2½ cents.

Will Maintain Normal Schedules.—Sufficient equipment was saved from the recent fire which destroyed its carhouse, containing eight cars and all the machine shop tools, of the Southern New York Railway, Oneonta, N. Y., to permit the operation of normal summer schedules. The company has no definite plans at this time as to the construction of the shops at the old location or to the purchase of additional equipment.

Suggests Public Vote on Transportation.—The city of Spartanburg, S. C., cannot proceed with its paving program until some decision is made as to whether the car tracks not in use in various sections of the city are to remain or be removed entirely. The board of directors of the Spartanburg Chamber of Commerce will recommend to the City Council that the Freeholders of the city at the general election on May 12 vote whether or not they prefer street car transportation or bus service. This brings up the question in Spartanburg which has remained unsolved now for about two years. At the present time buses are operating on all the main thoroughfares and one street car line is in operation on East Main and Pine Streets connecting with the Glendale and Clifton line. Recently the South Carolina Gas & Electric Company became a Barstow property. The franchise of the company provides for railway service.

Parley on Wages Set.—Representatives of the employees of the New York State Railways will meet on April 20 with officials of the company in the first conference over the wage and working contract for the year beginning on May 1. The opening parley will be held in the Rochester offices of the traction company. The workers on the Rochester, Syracuse and Utica lines of the company have asked for a 7-cent pay increase and the company has countered with a demand for a 5-cent decrease, as told in the April 11 issue of the ELECTRIC RAILWAY JOURNAL, page 594. Several clauses in regard to overtime and working conditions are at issue also.

East St. Louis Ordinance Defeated.—The voters of East St. Louis, Ill., by a majority of 600 on April 7 defeated the franchise ordinance granting the East St. Louis & Suburban Railway and its subsidiary, the Alton, Granite City and St. Louis Traction Company, a new franchise which would have exempted it from paying for street paving between its tracks on North Seventh Street and taxing it on the average number of cars operated during a 24-hour test period. In return for the franchise the company agreed to carry out certain work, including the removal of part of its elevated structure.

Rockford Company After New Grant.—A. D. Mackie, vice-president and general manager of the Illinois Power Company, Springfield, Ill., is giving part of his time to affairs in Rockford, where he will open a new campaign to secure a twenty-year franchise right for the Rockford Traction Company. Rehabilitation of the Rockford Traction will follow upon the formality of another referendum which will give it franchise rights. Citizens are now urging that the Council act so that another vote will not be necessary. It will be recalled that at the election on April 7 a proposal was defeated which had for its purpose the construction of a new system in the city to replace the present lines.

Maps Available for Passengers.—Pocket maps showing all routes and stations of the subway and elevated lines of the Interborough Rapid Transit Company, New York, N. Y., may now be obtained by passengers upon application to the station agents, according to information given out recently by Frank Hedley, president. On the back of the map are schedules showing distances and running time between stations. The actual running time, considering the number of station stops and distance covered, is shown to be practically the same on the elevated as on the subway, and the time saved by changing from local to express amounts to only a very few minutes at the best. The map shows routes of the subway division in red and elevated lines in blue, while sections jointly operated are indicated in red and blue.

Carriers for Patrons' Convenience.—The Arkansas Central Power Company, Little Rock, Ark., is offering a car fare carrier with twelve full fare tokens for 75 cents. Without the tokens the carrier sells for 10 cents.

Vacation Opportunities Stressed.—The Clinton, Davenport & Muscatine Railway, Davenport, Iowa, recently issued its spring and summer time-table in a folder which opened into a 12-in. x 12-in. placard advising its readers to "Ship by Traction," scheduling the advantages of the interurban shipping service and concluding with a few hundred words of the vacation opportunities along the interurban. The folder was lined with illustrations of shipments and pastiming to bear out the text.

Motormen Will Receive Accident Savings.—The sum of $9,650 will be distributed among the motormen of the Memphis Street Railway, Memphis, Tenn., on April 22. This represents the amount of savings effected during the past three months in the reduction of accident costs. The plan was started on June 1, 1923. The savings represent 2.92 cents an hour for each man sharing, and individuals will receive from $16 to $25, dependent upon the number of hours worked within the three months.

Safety Plan Reported Successful.—The safety savings plan adopted by the Des Moines City Railway, Des Moines, Iowa, has proved successful after six months of operation. Accidents have been reduced. Under the plan $4,550 was saved the first six months of its trial. Of this amount $3,000 is to be distributed among trainmen and $1,550 is to go into the savings relief fund for the benefit of trainmen.

Seeks Paving Relief.—Officials of the Princeton Power Company recently asked the city for relief from further paving obligations in Bluefield, W. Va. H. E. DeJarnette, vice-president of the company, pointed out that since the Princeton Power Company purchased the street railway system in the two Bluefields in 1920 it had invested more than $532,000 for improvements. He said the company this year had obligations of $192,000 in addition to operating expenses. East Princeton Avenue is slated for repaving from Lee Street east to the corporate limits this year. That brought the matter to a head. Final action was deferred, but an agreement incorporating the various angles of the proposition was ordered drafted to be submitted to the directors.

Smoking Prohibited.—An ordinance prohibiting smoking on street cars in Sioux City, Iowa, was recently passed by the City Council. Various women's organizations advocated the law.

Fares Increased.—The round trip fares for the Niagara Scenic Belt Line trip between Buffalo and Niagara Falls, N. Y., have been increased 10 cents per capita, with the approval of the Public Service Commission. The new fares are $2.40 for adults and $1.90 for children. The amended tariff becomes effective on May 6.

One-Man Cars in Service.—The Phillipsburg Transit Company has installed one-man cars on its lines in Phillipsburg, N. J. The company has been operating one-man cars on its Easton, Pa., division for some time.

Lower Fares Likely.—Reduction of fares on the Seattle Municipal Railway, Seattle, Wash., is a probability if citizens of Seattle will make more general use of its service, Superintendent D. W. Henderson declared recently in a letter to Councilman W. T. Campbell, who is advocating an advertising campaign in behalf of the car lines for the purpose of increasing patronage. The City Council utilities committee has already tentatively approved the plan. Superintendent Henderson presented a tentative advertising program covering a period of six months, proposing an expenditure of $17,000, of which $10,000 would be for newspaper and $7,000 for billboard publicity. Superintendent Henderson pointed out that the street railway is suffering keenly from competition with the private automobile, particularly from the practice of car owners picking up people for free rides. Patronage of the car lines has been gradually dropping off. In January, 1925, there were 1,000 fewer passengers a day than during the month of January, 1924.

Trucking Service Arranged.—The Rochester & Syracuse Railroad, Syracuse, N. Y., has arranged with local trucking concerns in Rochester and Syracuse to start a "pick-up and store-door delivery service" within the city limits of those two places.

Foreign News

The First Electrified Line in India Opened

The first electrified railway in India was opened on Feb. 3 on the Harbour branch of the Great Indian Peninsula Railway of Bombay. While this line is only about 10 miles long, it forms part of a general scheme for the electrification of the suburban lines from Bombay to Kalyan, a distance of about 40 miles, by the end of 1926. After the work to Kalyan is completed, the G. I. P. railway will take up the scheme of electrification to Igatpuri on the north. Suburban passenger traffic has been growing rapidly, due to development of the suburban areas for residential purposes, and it was thought that the steam service could not cope with the increased traffic.

Power is furnished by the Hydro-Electric Power Supply Company and is transmitted as 22,000-volt, three-phase a.c. and coverted to 1,500-volt d.c. by means of rotary converters in substations located at suitable intervals along the track. The overhead single catenary system has been adopted, the contact wires being carried on steel structures about 220 ft. apart. The return current is along the track rails through special copper bonds at rail joints.

The train unit consists of three trailers and one motor coach. The two end coaches are equipped with driving control and the unit can be operated from either end. The coaches are 68 ft. long, 12 ft. wide and are constructed entirely of steel with fireproof flooring. The carriages are fitted with automatic M.C.B. couplers and the standard A.V. brakes, as used on all Indian railways. Each motor coach is equipped with four 275-hp., 1,500-volt motors with a maximum speed of 50 m.p.h.

Automatic Route Guide

An apparatus which automatically points out the position of the car at any moment has recently been installed on about 150 cars of the Metropolitan Electric Tramways in North London and Middlesex, England.

A frame about 6 ft. long and 1 ft. wide is mounted above the window on each side of the car. This frame contains a moving chart which winds from one spool to another on the same principle as the film in a kodak. The chart is driven by a gearing on an axle of the car and the motion is transmitted to the spool by a flexible shaft, so that the chart moves with the movement of the car.

All stopping places and other important points on the routes are shown on the chart. In the center of the case is a fixed pointer which indicates the position of the car at all times. The chart is so graduated that it moves about 6 ft. for every mile traveled, which enables the passengers to see half a mile of the route traversed and half a mile in advance.

One of the great advantages claimed for this automatic guide is that it enables both passengers and conductors to determine the exact location of the car during the heavy London fogs.

Interurban Electrification Plans for Alsace

A plan for the electrification of various interurban lines in Alsace, hitherto operated by steam, has been presented to the French Chamber of Deputies. The first lines proposed to be electrified will be from Graffenstaden to Markolshein, from Strasbourg to Truchtersheim and Oberhausbergen and Westhoffen. The Strasbourg Street Railway has been granted a franchise for this operation.

Expenditure on these projects will exceed 3,000,000 francs, of which the national government and the communities interested with share the cost to the extent of 1,700,000 francs and the operating company the remainder. The city of Strasbourg actually owns 87 per cent of the invested capital in its street railway company, which amounts to 6,250,000 francs.

A surplus grant of 350,000 francs will be available from the national treasury, owing to various concessions which will be advanced by the national government. In addition the state will renounce all participation in the share of receipts in excess of a certain figure yet to be determined.

British Railway Extends Bus Service

The Lanarkshire Tramways, Lanarkshire, Scotland, recently purchased the Scottish & General Transport Company, a bus company, at Coatbridge and Airdrie. This business is to be developed along with the existing bus services.

The Lanarkshire company is reported to be the only one which has to pay way-leaves for running over the streets. The upkeep of roads has cost the company about £305,000 since it started operations and during the same period it has paid in local rates £124,000, and for way-leaves £54,000. In spite of these expenditures substantial dividends have been paid.

By an act of Parliament obtained in 1908 the Lanarkshire Tramways was authorized to run buses in extension of its tramway services.

Italy to Have New Railway

A project for a new electric railway linking Genoa, Milan and Turin, the three important commercial centers of northern Italy, has been approved by the Italian Ministerial Council. Work will be begun as soon as the project is approved by the Ministry of Public Works, and it is expected that the entire line will be in service by the end of 1928.

An innovation in financing of the road is that 6 per cent is guaranteed on the investment for a period of 60 years, after which time the equipment will revert to the state upon the reimbursement of customs dues on such part of the material and equipment as may have been imported for the length of the concession, including the construction period.

New Law Protects Car Riders.—A new law has been passed in Perth, Scotland, prohibiting vehicles from passing a stationary tram car at regular stopping places. A similar law is in effect in Glasgow, Edinburgh and Aberdeen. Numerous attempts have been made by tramway authorities in England to obtain Parliamentary enactment of a similar power for the safety of tramway passengers, but the government has opposed the proposal.

New Stations on London Railway.—Bids amounting to £231,999 have been accepted by the City & South London Railway for the construction of four stations on the Clapham-Tooting section of the Morden extension of the railway, now under construction. Two of the stations will be entirely below the surface, while the other two will have booking halls at ground level. All will be equipped with escalators.

Must Pay Loss to Strikers.—General Calles, as arbitrator, has sentenced the Mexico City Tramway, owned by Canadian interests, to pay 100,000 pesos for salaries and damages caused to strikers through loss of time when the company refused to recognize the bus union. Payments must be made of 50,000 pesos now and the other 50,000 in lots of 25,000. The company, backed by the motormen's and conductors' unions, defied the strikers, who formed bus drivers' unions, demanding recognition. The company alleged that the bus drivers were only a few, while the motormen's and conductors' unions had more than 4,000 members. These unions were against the bus drivers. After a strike of two weeks President Calles took a hand and demanded that the company immediately recognize the strikers' union. The company acceded to the demand. When the strike was settled the bus drivers demanded payment of salaries for time lost in the strike. President Calles was appointed arbitrator.

Proposed Tramway Extensions in England.—Permission to construct tramway extensions is being sought of Parliament by the tramway authorities in Blackpool, Burnley, Leeds, Liverpool, London and Middlesex.

Manchester Tramway Development.—A report of the work now in hand or which will be begun in the near future on the Manchester Corporation Tramways has been presented to the Council by H. Mattinson, general manager. The total estimated cost of the work is £550,000, of which £250,000 is for trackwork, £150,000 for new cars and £50,000 for a garage.

New Electric Railway in Spain.—An electric tramway 13 miles long was opened in February between Granada and the Sierra Nevada. This line has fourteen tunnels and 21 bridges and opens communications with several villages.

Financial and Corporate

Trustees Issue Report of Bay State Property

Due especially to depressions in mills and factories, earnings of the Eastern Massachusetts Street Railway, Boston, Mass., fell off $993,343 in 1924 to $9,012,808, or about 10 per cent compared with 1923. This statement was contained in the report of the public trustees of the company for the year ended Dec. 31, 1924.

Interest and income decreased $67,600, due to the necessary disposals of securities to meet maturities and other obligations. Rentals and advertising revenue decreased $22,400 on account of lesser car-miles and cars in operation.

COMBINED INCOME STATEMENT OF ALL OPERATING DISTRICTS, EASTERN MASSACHUSETTS STREET RAILWAY

	1924	1923
Street car revenue	$9,012,808	$10,006,151
Auto bus revenue	194,157	76,390
Freight and other revenue	44,376	46,034
Rentals and advertising	211,323	233,741
Interest and other income	282,837	350,390
Total revenue	$9,745,501	$10,712,706
Expenses:		
Way and structures	$1,313,669	$1,811,203
Equipment	1,303,516	1,395,814
Power	1,021,057	1,219,870
Car operation	2,249,346	2,461,328
Injuries and damages	402,538	365,093
Insurance	94,797	84,810
Law expense	32,497	15,750
Rent of tracks	77,787	68,522
General wages and expenses	240,409	246,322
Pensions and group insurance	82,086	77,405
Stationary and printing	35,059	41,424
Stores and garage expenses	72,553	104,814
Miscellaneous expense	36,972	51,430
Auto bus expense	270,388	116,729
Total operating expense	$7,232,674	$8,060,514
Total operating expenses and taxes	$7,581,444	$8,436,019
Gross income	2,164,057	2,276,687
Interest and rentals	1,362,658	1,398,152
Net income	$801,399	$878,535

Net reductions were made in general operating expenses aggregating $827,840. The decrease in car-miles savings, in snow and ice expense and carhouse economies reduced the cost of car operation $212,000. A reduction of $199,000 in power cost was due to a combination of lower prices for steam fuel and decrease in car mileage. As a result of systematic improvements made during the past five years, it was possible to reduce the way and structures expense $498,000 without abatement of rehabilitation work or impairment of the physical condition of the property.

Progress on the rehabilitation of track and roadway continued, expenditures for 1924 being $1,006,477 compared with $1,510,182 in 1923. Trackwork representing $255,921 was considered to offset the depreciation to that amount, and additional work of $138,644 was charged to the rehabilitation fund. Modernization of the rolling stock and adherence to the plan of regular overhauling of cars were large factors in cutting down the equipment expense $92,000.

Bus operation was continued on a much larger scale, the total number of miles operated being increased from 395,240 to 869,269. The gross revenues from this source were $194,157, compared with $76,390 in 1923.

During the year insurance payments aggregating $36,200 were made in sixteen death cases, and in addition nine employees are receiving monthly payments under the total disability clause of the insurance policy. Pensions amounting to $18,644 were paid during the year.

The total dividend payments for the year were $719,618. Funded obligations of the company to the amount of $1,581,000 were retired and canceled.

Correction in Richey Index of Fares

The Richey monthly index of street railway fares, as published in the fourth issue of this paper each month, has been revised to correct an error which occurred in October, 1924. The result of this revision has been to increase the rate of fare, as shown in the Conspectus, since October. The figures as published and the revised figures, as furnished by Mr. Richey, follow:

Month		Index as Published	Corrected Index
October,	1924	7.15	7.22
November,	1924	7.17	7.24
December,	1924	7.17	7.24
January,	1925	7.17	7.24
February,	1925	7.17	7.24

The figure 7.26 cents, printed in the March index, is correct.

Loss to Stabilizing Fund in Toledo

Commission Says Toledo Could Be Put on a Par with Service-at-Cost Cities Elsewhere—Safety Work Stressed

OPERATIONS of the Community Traction Company, Toledo, Ohio, for the past year as prepared for the City Council, by acting Commissioner E. L. Graumlich, show that $3,390,467 has been expended for maintenance, depreciation and rehabilitation of the property during the three years and eleven months the Milner service-at-cost measure has been in effect. This exceeds the total amount spent in this way in the preceding six years. The report indicates that the most important piece of work accomplished since the beginning of the service-at-cost plan has been the building up of the traction property to operate economically and with comfort, convenience and safety to the car riders.

An income and expense consolidated statement for the period under which the Milner ordinance has been in effect shows the Community Traction Company to have received $13,497,783 in passenger revenue. After the consideration of interest paid on bonds and dividends on preferred stock there was a net profit of $384,862. Against this was charged $934,363 for sinking fund, leaving a deficit of $549,501 in the stabilizing fund. Mr. Graumlich's report concludes with the assurance that the Toledo system could be put on a par with other cities having service-at-cost plans "with renewed industrial activity" and co-operation of the City Council in eliminating unnecessary losses and aiding in carrying out economies that prove to be sound and recommended by the commissioner and company.

The accompanying table shows the operation of the Community Traction Company in 1924 compared with 1923. During the past year $835,925 was spent in maintenance and a large program has been set up for the present year. Economies put into practice reduced operating expenses from $3,286,283 in 1923 to $3,214,053 in 1924. Bus feeder lines caused a loss of $11,446, but indications are some of the older

SUMMARY OF OPERATIONS AT TOLEDO FOR THE YEAR ENDED DEC. 31

			Cents per Car-Mile	
Revenue from transportation:	1924	1923	1924	1923
Passenger revenue	$3,515,692	$3,610,139	49.456	46.699
Special cars	465	932	......	......
Miscellaneous	488	689	......	......
Total transportation revenue	$3,516,646	$3,611,761	49.470	46.720
Other operating revenue:				
Station and car privileges	21,209	20,399	......	......
Rent of equipment	8,277	11,332	......	......
Rent of tracks and terminals	233,155	239,433	......	......
Total other revenue	$262,642	$271,165	3.695	3.508
Non-operating revenue	15,200	15,930	.214	.206
Gross income	$3,794,490	$3,898,857	53.379	50.434
Expenses:				
Maintenance and repairs	770,000	640,000	10.832	8.279
Operation	2,123,278	2,327,528	29.869	30.108
Depreciation	135,925	132,005	1.912	1.707
Taxes	183,450	181,484	2.581	2.348
Interest floating debt	1,398	5,264	.019	.068
Total expenses	$3,214,053	$3,286,283	45.213	42.510
Net income	$580,436	$612,574	8.166	7.924
Deductions from income:				
Sinking fund	226,543	220,009	3.187	2.846
Bond interest	480,000	460,000	6.752	6.209
Preferred dividends	84,845	62,274	1.194	.805
Total deductions	$791,388	$762,274	11.133	9.860
Stabilizing fund—Deficit	$210,951	$149,700	2.967	1.936

lines may soon become self-supporting through development of new business. Net loss to the stabilizing fund during 1924 was $210,951, while credits to the city-purchased sinking fund totaled $226,543.

Total passengers carried in 1924 were 55,077,103 compared with 64,719,404 in 1923. Unemployment and higher fares are both declared to be contributing causes to this slump, but ownership and operation of private automobiles and competition of bus lines are said to be the outstanding reasons.

Mr. Graumlich in his report said that the independent bus lines were continuing to divert a large amount of revenue, and this fact within itself had been the chief cause of the higher rates of fare than should obtain in Toledo. He said that an accurate check of these bus lines taken at frequent intervals showed that the company could have operated without a loss during 1924 had these passengers been carried on the street cars.

A feature of the annual report was the reference to reduction of accidents to the public amounting to 27.2 per cent, or from 4,312 in 1923 to 3,130 in 1924. Expense of the claim department was $159,801 in 1924 compared with $189,841 the previous year. The decrease in accidents over the entire system was brought about by a better maintained property, one-man car operation, closer inspection of equipment and main thoroughfare system of regulating traffic in the city.

Number of collisions with automobiles shows a reduction of 22.6 per cent, due largely to better enforcement of the main thoroughfare system which made all streets with car lines main thoroughfares and required automobiles to come to a full stop or under control before crossing streets.

Montreal Financial Structure Being Simplified

A decided step has been taken toward simplifying the position of the Montreal Tramways & Power Company, Ltd., Montreal, Que., which will doubtless lead eventually to its winding up. So said the Montreal *Gazette* in its issue of April 1. This company held in its treasury $7,000,000 of the debenture stock of the tramways company, which it exchanged for new bonds and which have been sold, and the proceeds of this sale and a bank loan of about $2,800,000 were used on April 1 to redeem the $8,000,000 of 6 per cent five-year bonds. This leaves the Montreal Tramways & Power Company holding assets consisting of 21,000 shares of Montreal Tramways, which it has hypothecated to United Securities, Ltd., to secure the loan of $2,800,000.

The *Gazette* says it seems logical that the United Securities will eventually purchase these shares, wiping out the loan as part of the purchase money. Apart from this debt the Montreal Tramways & Power Company has no liabilities, all of these having been wiped out by previous advances from United Securities. Other assets of the Montreal Tramways & Power Company, consisting of shares in the Montreal Hydro-Electric Company, have but a nominal value. The policy of the present management will doubtless call for the elimination of the holding company.

Another feature which gives point to this forecast is that out of the 175,000 shares of Montreal Tramways & Power Company for which preferred and common shares in United Securities were offered in exchange, more than 170,000 shares have already been turned in. The Canadian paper says further:

> The anomaly of having an English registered company operating in Canada as a holding company of Montreal Tramways, and having a capital of more than $17,000,000 par value, will doubtless be dealt with in due course. The confusion which has been present in the affairs of these companies is fast being removed and a clear and clean-cut organization will eventually arise.

Court Action Delays Twin City Settlement

Whether the Minnesota Railroad and Warehouse Commission or the District Court is to have jurisdiction over the St. Paul City Railway will be determined by the Minnesota Supreme Court in an appeal hearing on April 30. If the decision is in favor of the city of St. Paul, the commission will be ousted automatically from control, says Commissioner Ivan Bowen. A law passed at the 1920 Legislature gave the state control through the commission. The St. Paul City Railway has filed a brief in the appeal and the city had twenty days in which to reply. Meanwhile all proceedings to determine the rate of fare in Minneapolis are held up.

The Railroad Commission reported a valuation for the properties of the St. Paul lines and the Minneapolis Street Railway. Immediately St. Paul took the matter into court and the judge ordered the commission to file its valuation. The commission and the railway contended that this was only a step and that until the rate of fare is set there is nothing determined and no order from which to take appeal.

In the railway brief the counsel states that the city of St. Paul is trying to prevent fixing a permanent rate of fare by proceedings that are unwarranted, idle and destructive and an avowed attempt to prevent the commission from performing its duties. It contends that if every step taken by the commission preliminary to fixing the rate is immediately subject to court review the resulting delay will defeat the entire purpose of the legislation. Meanwhile enforced operation by a company at an inadequate rate of return is continued denial of the rights of the company, as each day's delay that entails a loss destroys the company's property. The commission has filed a similar brief declaring St. Paul's action premature.

Meanwhile a bill in the Legislature authorizing the commission to establish a one fare rate in the metropolitan zone, which would include both cities, is meeting with support in St. Paul and strenuous opposition from Minneapolis before the committee of the Legislature. A bill has been introduced also which would restore the one fare rate into St. Paul midway from Minneapolis. This was abolished when the commission took over the railway jurisdiction.

Kansas City-Clay County Line Gross Revenue Falls Off

Net earnings from operation of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., for the year ended Dec. 31, 1924, fell below those of the year previous. After all expenses, including interest on bonds and dividends on preferred stock, there remained $44,600 for depreciation and $24,139 for a net surplus. Of the gross revenue 15⅔ per cent was expended for maintenance. In 1924, 1,827,521 passengers were carried, against 2,453,339 in 1923. These facts are contained in the annual report for the fiscal year ended Dec. 31, 1924.

The company gives three primary reasons for the decline in gross revenue: First, the general depression of business in that section of the country; second, the completion of the hard-surfaced highway parallel with the electric railway between Kansas City and Excelsior Springs, followed by an increase in the number of privately owned automobiles, and, third, the rapid development in the operation of commercial buses and trucks throughout the year.

The report says that the encroachment of the motor coach service on the Excelsior Springs division was watched by the staff of the company and on Aug. 7, 1924, the Kansas City, Clay County & St. Joseph Auto Transit Company, organized by interests representing stockholders of the company, began motor coach operation between Kansas City and Excelsior Springs, and on Dec. 3, 1924, a coach line was established along the St. Joseph division

SUMMARY OF RESULTS FROM OPERATION OF THE KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY

	1924	1923
Railway operating revenue		
Transportation revenue, St. Joseph division	$692,929	$755,190
Transportation revenue, Excelsior Springs division	277,130	466,525
	$970,060	$1,221,716
Other operating revenue, St. Joseph division	5,665	6,333
Other operating revenue, Excelsior Springs division	2,154	6,991
	$7,820	$13,324
Total operating revenue	$977,880	$1,235,041
Railway operating expense:		
Way and structures	$85,569	$107,070
Equipment	61,866	85,695
Power	114,906	129,812
Conducting transportation	211,144	228,032
Traffic	10,157	7,966
General and miscellaneous	128,887	157,354
*Depreciation	44,645	100,060
Taxes (except income taxes)	29,837	29,094
Total	$687,014	$845,087
Operating income	$290,866	$389,953
Non-operating income:		
Interest funded securities	5,105	2,490
Increst unfunded securities	6,328	5,547
Total	$11,433	$8,038
Gross income	$302,299	$397,992
Deductions from gross income:		
Interest	$161,402	$161,450
Miscellaneous	3,257	. . . .
Total	$164,659	$161,450
Net income	$137,639	$236,542
Less estimated income taxes	5,000	24,892
Balance available for surplus and dividends	$132,639	$211,649

*The auditors have taken accrued depreciation less expenditures for renewals and replacements, $42,085 as an appropriation of surplus—add that amount and minor adjustments of $137 to check their surplus net income of $174,862.

between Kansas City and Trimble via Smithville, 26 miles. On Jan. 20, 1925, the company began the operation of an auto service to complete the distance between Kansas City and St. Joseph. In this way both divisions have auto service furnished in the interest of the electric railway.

During the year the gross revenue from freight was $153,791, with gross tons 48,789. In 1923 the gross revenue from freight and the gross tons were $194,988 and 96,352 respectively. The 1924 figure does not include revenue from "electric express," which was put in operation in March, 1924, for handling package freight. This business has grown substantially and more than 900,000 lb. of freight was handled with gross revenue of $4,740 from March 17 until the end of the year.

During 1924 only $5,573 was expended by the claim department for accidents. The amount expended during 1924 for accidents occurring previous to 1924 was $5,521.

The accompanying tables show the results of operation of 1924 and 1923 and some operating statistics for 1924.

Dividends on Common Expected in Louisville

Railway Effects Economies in Operation—Report Scores Jitney Competition and Predicts Higher Fare in 1926—Review of Operation of Bus Subsidiary

THE result of 1924 operation by the Louisville Railway, Louisville, Ky., was a net withdrawal from the barometer fund of $67,393. This was disclosed in the annual report of the president to the stockholders of the company at the annual meeting. The year 1924 was the second year of operation under the new operating ordinance, which became effective on Sept. 13, 1922. In 1924 the balance available for dividends was $535,394, compared with $36,253 in 1920, an improvement in four years of $499,140, while the condition of the physical property improved continuously.

The year 1924 shows the largest balance available for dividends of any year since the war and the improvement since 1920 has been continuous except for a small setback in 1923, the first year of operation under ordinance No. 330, when the revenue for transportation showed a decrease of $102,679 from that of the preceding year and the balance available for dividends was $15,437 less than the preceding year.

In 1924 the revenue from transportation was $8,457 less than in 1923, but the balance available for dividends was $45,852 more than in that year. This improvement was brought about by economies effected during the year. Safety and co-operative association work during 1924 cost about $19,000, but there was a net reduction in accident expenditures of $30,000 compared with the previous year and $87,213 compared with 1920.

In 1921 the operating expenses were $3,273,000 and in 1924 $2,995,000. This means that in 1924 the public was served by the company at a cost of $278,000 less than in 1921 in spite of the fact that in the year 1924 11,662,247 car-miles were operated, compared with 10,834,921 car-miles in 1921. An analysis of the $278,000 saving in complete detail shows that safety work accomplished approximately $87,000 per year, economy in power generation about $100,000 and economy in operation about $50,000.

The year's program of repair and upkeep was a heavy one. The running repairs called for replacements of 26,540 ties, 266 poles and 27,353 lb. of trolley wire and during the same period the interurban lines required 26,639 ties and 224 poles and 2,434 lb. of trolley wire. The program for power economies outlined in the report for 1923 was completed in 1924. The last six months of 1924 showed a saving for power of slightly more than $50,000 over the corresponding period of 1923.

The cars purchased under the series "B" car trust reported last year were placed in service on March 9, 1924, and have added greatly to the comfort and convenience of the service. During the year track reconstruction included the rebuilding of 4.53 miles of track in paved streets at a cost of $169,076 and the installation of new special work at nine locations to improve operations at a cost of $28,479.

One hundred and thirty-six employees of the company, including the Kentucky Carriers, Inc., ran without an accident during 1924 and twelve of them had no accident in three years.

The Co-operative Association had a most successful year. It paid out during 1924 $12,769 in sick benefits and $3,925 in death benefits and had on hand on Dec. 31, 1924, a surplus of $68,066, of which $63,183 was invested.

The Kentucky Carriers, Inc., was organized in June, 1923, with $101,500 capital paid in by the Louisville Railway. No profit from early operation was expected, as it was rather the plan to offer the most up-to-date transportation system in Louisville, looking to the future to justify by financial return this policy of assisting in the upbuilding of the city. The first 18 months' operation of the Kentucky Carriers, Inc., was a net loss, but in December, 1924, the tide seemed to turn, and since that time coach operation has been doing better.

COMPARATIVE INCOME STATEMENT OF LOUISVILLE RAILWAY

	1924	1923
Operating revenues:		
Revenue from transportation	$4,247,314	$4,255,771
Other operating revenues...	202,364	190,094
Total operating revenues.	4,449,678	4,445,866
Operating expenses..........	2,995,972	3,078,522
Net revenue from operations	$1,453,706	$1,367,344
Taxes....................	401,000	396,000
Operating income.........	$1,052,706	$971,344
Non-operating income:		
Louisville & Interurban Railway—net income....	$126,365	$127,256
Other non-operating income	12,165	37,816
Total non-operating income	$138,530	$165,072
Gross income............	$1,191,237	$1,136,416
Deduction from gross income:		
Interest on bonds and notes	$651,750	$645,819
Miscellaneous debits.......	4,093	1,055
Total deductions........	$655,843	$646,874
Balance available for dividends on stocks.................	$535,393	$489,542

More recent reports indicate during January, 1925, an excess of approximately 1 cent per bus-mile over the cost of operation. Receipts during the first three months were 10 cents per bus-mile. At the end of the first year they were 15 cents per bus-mile. During December, 1924, receipts were more than 20 cents per bus-mile and for January, 1925, reached 21.4 cents. The cost of operation averaged 20.43 cents per bus-mile. This is divided into 9.91 cents for maintenance, including depreciation; 8.5 cents for conducting transportation (including bus operators' salaries), and 0.3 cent per bus-mile for taxes (state license, city license, jitney and taxicab license, and also drivers' license).

Increase in receipts is attributed to the fact that the public is becoming accustomed to the service rendered. The original policy of providing a seat for every passenger at a 10-cent fare has been abandoned and standees are being carried. During the rush hours, the average load is 35, which means that ten passengers have to stand for at least a portion of the trip.

Bus service in Louisville was started in June, 1923, when twelve White Model 50 buses with 25-passenger bodies were installed on a 3-mile route. The length of route was subsequently extended to 5½ miles, and then a second line was put into operation. This latter proved unsuccessful and was abandoned. Attention was concentrated on the original route in an endeavor to make it financially successful. Changes in headways and length of runs were made until the service suited the requirements in the exclusive residential section served by the line.

The buses are operated on streets entirely free of car lines except in the downtown business district. Under existing conditions operations are being carried out on the basis of 484,000 bus-miles per accident.

The report refers to the jitney service and says that if it were eliminated not only would the safety of traffic on the streets be improved and congestion largely eliminated but the additional transportation revenue accruing to the street cars would amount to something more than $100,000 a year. The attention of the city officials has been frequently called to the fact that an increase of $100,000 in transportation revenue would be sufficient under present operating conditions to build up the barometer fund and justify the hope that the rate of fare might eventually be decreased. The present tendency of operation, according to the report, is resulting each year in a withdrawal of the barometer fund. Although the 1924 withdrawal was smaller than that for 1923, there is no promise of a decrease in fare but rather to an increase in 1926.

Funds received month by month from

the barometer fund have been sufficient to pay during 1924 the deferred dividends on preferred stock due in 1921, 1922 and 1923 and on Feb. 15, 1925, the 1924 dividends were paid, so that for the first time since 1918 the company stands in a position of having to meet only current preferred dividends. Mr. Barnes says that during 1925 withdrawals from the barometer fund applicable to common stock will accrue and by the end of the year the company expects to be in a position to consider a dividend on common stock.

$2,750,000 Put Back Into Denver Tramway Without Financing

Edwin M. Bosworth & Company, Denver, Col., have prepared an analysis of the operations of the Denver Tramway, especially with reference to the first and refunding sinking fund 5 per cent mortgage of 1923, in which it is shown that since the receiver was appointed in December, 1920, to the present time, a four-year period, the earnings have averaged more than $200,000 a year, after payment of taxes and fixed charges on all of the $17,500,000 funded debt outstanding. Upon a similar basis, the earnings for the first ten months of 1924 were $196,000, compared with $155,000 for the same period of 1923.

Improvements and renewals costing approximately $2,750,000 have been made during the receivership, without the necessity of issuing any obligations by the receiver. This amount expended for improvements is almost identical with the interest which has been defaulted on the following issues:

	Oustanding	Annual Interest
Denver City Tramway first and refunding sinking fund 5s of 1933	$10,107,750	$505,388
Denver & Northwestern first and collateral of 1932	278,100	13,905
Denver Tramway collateral 7 per cent notes of 1922	2,498,000	174,850
Total	$12,883,850	$694,143

On the first item above the interest has been in default since Nov. 1, 1920. In fact, it was this default that led directly to the receivership. Therefore, to each $1,000 bond of this issue is attached past due coupons of a face value of $225.

This $10,107,750 refunding and sinking fund lien of 1933 is a direct obligation of the Denver Tramway. It is secured by a mortgage on all its property, franchises, etc., now owned or hereafter acquired, including the entire railway system of the city of Denver, consisting of 203 miles of track, subject to the underlying bonds.

The company is operated as one system with the Denver & Northwestern Railway, which owns 26 miles of railway between Denver and neighboring towns. The present mileage of the system thus aggregates 229.

These bonds are also secured by the pledge of $2,670,000 of a total issue of $3,837,000 Denver Consolidated Tramway first consolidated 5s of 1933. The analysis of the company says:

> The decision of the federal court in December, 1924, establishes the value of the property at a figure approximately $6,000,000 greater than the total funded debt of the company and establishes the contention of the company that rights to the use of streets granted in 1885 and 1888 are perpetual. It also sustains the position of the company in its refusal to decrease the present 8-cent fare.
>
> It is believed by well informed persons that the decision paves the way for reorganization. This will probably result in a scaling down of the total funded debt of the company by from 20 per cent to 30 per cent and a scaling down of the sinking fund bonds of 1933 by from 25 per cent to 50 per cent, the remaining 25 per cent to 50 per cent, together with the defaulted interest, to be compensated by preferred stock.

Loss in Traffic on Connecticut Company's Lines

The report of the 53d year of the New York, New Haven & Hartford Railroad states that due to the very material decrease in industrial activity in the territory served by the Connecticut Company there was a decrease in patronage of the cars throughout the year. An increase in the token rate of fare from two tokens for 15 cents to three tokens for 25 cents, effective Feb. 10, 1924, and economies in operation offset in part the effect of the loss in patronage on the net revenue. On the New York, Westchester & Boston Railway there was an increase of 509,401 in passengers carried during the year. A new terminal facility at Harlem River was opened during the year providing more convenient and quicker transfer from the New York, Westchester & Boston Railway to the Interborough system. An extension from Larchmont to Mamaroneck has been authorized.

The accompanying table shows the income accounts of the electric railway properties of the New York, New Haven & Hartford Railroad during the year 1924 compared with the previous year.

Georgia Property Sold

The Gainesville Railway, Gainesville, Ga., was sold on April 7 for $8,200 at public auction to satisfy a paving assessment of that amount levied by the city. T. E. Atkins, president of the state banking company of Gainesville, bought in the road for the amount of the assessment. He acted for J. H. Reynolds, a client of the bank, and stated that the road would be sold for junk in the near future. There were no other bidders.

The railway covered about 10 miles of street. Inroads by private automobiles destroyed its ability to show a profit and for several years it was operated at a loss.

The establishment of jitney lines further incapacitated the company, and when the city of Gainesville recently issued a paving assessment of more than $8,000 against it, directors of the company agreed to let the road go. It suspended operation on April 4.

Bakersfield & Kern Property Included in Sale

The controlling syndicate of the San Joaquin Light & Power Corporation, Fresno, Cal., recently sold that company, the Midland Counties Public Service Corporation and the Bakersfield & Kern Electric Railway to the Western Power Corporation of New York. Since that time A. G. Wishon has been made president; A. Emory Wishon, vice-president and general manager; A. C. Balch of Los Angeles is still vice-president; B. R. Meyer of Los Angeles is also one of the vice-presidents; W. E. Durfey is secretary, Ernst E. Behr, treasurer and comp-

	Connecticut Company		New York, Westchester & Boston Railway		Berkshire Street Railway		New York & Stamford Railway		Westchester Street Railroad¶	
	Year 1924	Comparison with 1923 Increase or *Decrease*	Year 1924	Comparison with 1923 Increase or *Decrease*	Year 1924	Comparison with 1923 Increase or *Decrease*	Year 1924	Comparison with 1923 Increase or *Decrease*	Year 1924	Comparison with 1923 Increase or *Decrease*
Total operating revenues	$14,374,838	*$342,394*	$1,521,446	$68,503	$928,578	*$56,565*	$513,807	*$11,805*	$216,648	*$6,353*
Total operating expenses	11,590,736	*82,717*	993,196	24,545	774,069	*108,939*	394,151	*29,897*	209,755	*6,749*
Net operating revenue	$2,784,102	*$259,676*	$528,249	$43,957	$154,508	$52,373	$119,655	$18,092	$6,892	$395
Tax accruals	588,456	11,783	210,016	8,554	39,138	*5,144*	24,696	*273*	12,659	*43*
Operating income	$2,195,645	*$271,460*	$318,233	$35,403	$115,370	$57,518	$94,959	$18,365	†*5,766*	439
Non-operating income	50,433	*12,184*	10,627	4,696	1,777	*1,486*	3,806	3,273	1,175	*56*
Gross income	$2,246,079	*$283,645*	$328,861	$40,100	$117,147	$56,031	$98,765	$21,638	†*4,590*	†$383
Deductions from gross income	1,543,611	39,133	*1,963,789	58,314	‡294,982	*3,690*	§112.055	1,776	‖33,436	1674
Net income	$702,468	*$322,778*	†*$1,634,928*	*$18,214*	†*$177,834*	$59,722	†*$13,289*	$9,861	†*$38,027*	*$291*

*Deductions from gross income include $1,042,335 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

†Deficit.

‡Deductions from gross income include $209,980 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

§Deductions from gross income include $40,225 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

‖Deductions from gross income include $26,858 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

¶The Westchester Street Railroad is entirely separate from the New York, Westchester & Boston Railway. The operating expenses were 96.82 per cent of the total operating revenues, a decrease of 0.27 per cent as compared with the year 1923. Road in the hands of receiver from Feb. 29, 1920—receiver's account included.

troller, and Murray Bourne general counsel. The principal place of business is now Fresno instead of Los Angeles.

Providence Traffic Off

Loss of $405,231 Sustained in 1924 Despite Economies—Industrial Conditions Adverse

Due to a gradual and continued slowing down of industry until a serious condition of unemployment prevailed, not only in the textile industry in Rhode Island but also in many other industries, riding on the lines of the United Electric Railways, Providence, R. I., decreased to such an extent that it was necessary to curtail service, reduce forces and substitute bus operation for trolley service on light-riding suburban lines. Figures of passengers carried reflect accurately the extent of this depression. Whereas in 1923 there were 138,578,286 revenue passengers on the cars and buses of the system in 1924 there were 114,385,566, or 24,192,720 fewer than in 1923, the best year in the company's operation. Notwithstanding the economies put into effect by the company and an increase in the rate of fare effective May 27, 1924, there was a deficit of $405,230 for 1924.

CONDENSED INCOME AND SURPLUS ACCOUNT, UNITED ELECTRIC RAILWAYS, PROVIDENCE, R. I., YEAR ENDED DEC. 31, 1924

Total revenue from all sources		$8,196,694
Operating expenses..........	$6,660,236	
Depreciation and equalization reserves....................	861,699	
Taxes....................	336,570	
Bond interest and other deductions from income..........	696,909	8,555,415
Net loss from operations for the year................		$358,720
Add: Miscellaneous adjustments................		46,510
Deducted from surplus...		$405,230
Surplus account:		
Balance Jan. 1, 1924, per Ernst & Ernst report.......		$1,465,690
		$1,060,459
Add: Donations and claims....	$13,111	
Less: Adjustments for property retired..................	1,801	11,309
Surplus Dec. 31, 1924.......		$1,071,768

Among the economies in operation the report states that at the close of 1923, 28 of the company's 60 trolley lines were under one-man operation and 43 lines were under one-man operation on Dec. 31, 1924. Another economy, the reduction in the number of employees, was necessary as a result of the increase in the establishment of one-man car lines. The report states that if a lower wage schedule and less arbitrary working conditions had been in effect the company would not have been forced to employ such drastic measures in the reduction of its forces and service and could have offered at least part time employment to many of those who were laid off indefinitely.

In December, 1923, 83,817 bus-miles were operated and in December, 1924, the bus-miles operated exceeded 139,000. Most of the routes established in 1924 were in substitution for unprofitable trolley lines operating from populous into thinly settled suburban territory. These lines even under bus operation do not show a profit, but have substantially reduced losses.

In respect to the policy of replacing trolley lines by bus lines, it is the company's opinion that in some cases buses are a satisfactory substitute for nonpaying trolley lines operating into sparsely settled suburban territory, but that the important province of the bus really is as a supplement to the railway. Rather than discontinue trolley lines in suburban territories and leave a community without any public transportation facilities, the company replaced some suburban trolley lines with bus lines, and has, by so doing, either been able to make these lines meet the cost of service or to reduce losses very substantially. The company has also established bus service in communities which heretofore have had no public transportation facilities. These lines connecting with the trolley lines serve as feeders and thus supplement the existing system.

The company explains the negotiations as to labor conditions and states that the outcome will probably be arbitration.

The work of preparing its rate case was completed early in 1924 and on April 26 the company filed with the Public Utilities Commission new tariffs providing for a rate of fare which it was hoped would meet the cost of service, including a 6 per cent return on capital stock. After careful study an 8-cent cash fare with five tickets for 35 cents was decided upon. The new tariff became effective on May 27. But the business depression of 1924 curtailed the volume of traffic carried and this so reduced gross earnings that it was impossible to meet the full cost of service notwithstanding the adoption of operating economies and the increase in the rate of fare.

The income and surplus account for 1924 are shown in the accompanying table.

Investment of Sun Life in Illinois Traction Explained

Additional light has been shed on the interests which the Sun Life Insurance Company of Canada took in the financing of the Illinois Traction Company, succeeded some time ago by the Illinois Power & Light Company. In an article in the *Financial Post* of Canada T. B. Macaulay, president of the Sun Life Insurance Company, is quoted as saying that big profits were made by the Sun Life on its investments in the Montreal Light, Heat & Power Company and in the Illinois Traction Company. He says that in all between $3,000,000 and $4,000,000 was made on its Illinois Traction investment.

The *Post* contains some interesting history on the connection between the Sun Life Insurance Company and the Illinois Traction system. It states that the investment in the Illinois Traction caused criticisf of the Sun Life in some quarters and of Mr. Macaulay himself. It was felt that the Sun Life was unwise in having so large a proportion of its investments in one company, especially in an American company, although at that time the Illinois Traction investment represented a division of risk between companies serving 55 different communities in five different states. These companies were all controlled by the Illinois Traction, but their businesses were varied and covered the field of electric and gas generation to a greater extent than the less profitable field of electric street railway operation. The Illinois Traction group of companies came through the storm of the after-war period successfully. Mr. Macaulay then saw that the time was ripe for the Sun Life to reap a profit on its investments in this group and he sold the holdings. A check for $30,903,881, representing part of the sale price, was given Mr. Macauley.

Mr. Bodine as Public Service Director.—At the annual meeting of the Public Service Corporation of New Jersey Newark, N. J., Samuel T. Bodine was elected a director to succeed Lewis Lillie. Other directors were re-elected.

New Receiver Appointed.—J. P. Ingle, formerly general manager of the Jacksonville Traction Company, Jacksonville, Fla., has suceeded E. J. Triay as receiver of the property. He was appointed by Federal Judge Rydon M. Call.

Seeks Appointment of Receivers.—A suit asking for appointment of a receiver for the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., was filed in Marion County Circuit Court at Indianapolis on April 10. Katherine Shriner of Boston, Mass., is the plaintiff. Phillip McGowan, secretary of the company, declared the suit was a protest move on the part of a small minority of bondholders of the old Indianapolis & Northwestern Traction Company against extension of bonds of the company for a period of ten years. The Indianapolis & Northwestern was absorbed by the Terre Haute, Indianapolis & Eastern Traction Company several years ago. Approximately 90 per cent of the bondholders agreed to the extension, according to Secretary McGowan.

Seeks to Abandon.—The New Jersey Interurban Company, Phillipsburg, N. J., has asked permission of the Board of Public Utility Commissioners to abandon trolley tracks along the route from Phillipsburg through Stewartsville, New Village, Broadway, Washington and Port Colden. The company suffered a loss of $17,000 in 1924, not including depreciation or payment of interest on funded debt. It asks to continue an emergency auto service pending a hearing on April 24 at Washington, N. J. At this time counsel will submit an application for the New Jersey Interurban Coach Company to operate buses over the above route.

Right-of-Way to Be Sold.—A sheriff's sale of all the right-of-way and other property of the Jersey Central Traction Company, which formerly operated an electric railway from Red Bank to Keyport, Monmouth County, N. J., will be held at Freehold, N. J., on April 20 to satisfy a judgment of $19,483. The sale consists of all the right-of-way together with all the rails and ties, all the sidings and the bridges across the Shrewsbury River at Red Bank and over the railroad near Keyport. The sale will also take in any right or claim held by Herman Schlichting, who bought part of the right-of-way with the idea of operating straight gasoline cars over the route.

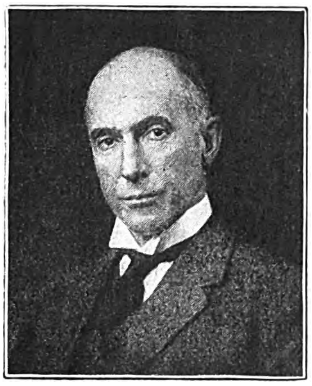
Personal Items

Mr. Black Retires

Head of San Francisco Road Gives Up Active Duties, but Continues with Engineering Firm

Charles N. Black, president of the Market Street Railway, San Francisco, since 1922, has resigned and has been succeeded by Mason B. Starring, New York, president of the United Railways Investment Company, holding company of the San Francisco railway system. Mr. Black will remain a director.

Mr. Black has been connected with the Market Street Railway in various capacities for the last seventeen years. For many years he has been looking forward to the day when he could feel at liberty to relinquish the duties of business and devote the remaining period of his life to pursuits that appealed to his personal taste. The present seemed an opportune time to put this plan into effect.



C. N. Black

The period covered by Mr. Black's connection with the company was an unusually eventful one. It is beyond hope even to attempt to summarize the record of these years. Among the outstanding events, however, were the recovery of the company from the effects of the earthquake and fire and the construction of the first section of the municipal railway as an incident anticipatory of the San Francisco fair. This last-mentioned event brought the private company and the city into direct competition, but under Mr. Black's direction, relations have been established between the company and the municipality which are of the most cordial character. As Mr. Black sees it, there is no reason why this condition should not continue until there is developed a plan for a unified service which the interests of the city imperatively demand.

Sight must not be lost, however, of the fact that the management has been confronted with other unusual operating problems. San Francisco still has a 5-cent fare with a universal transfer, and this in spite of the fact that the cost of everything entering into the operation and maintenance of a street railroad is practically 100 per cent higher than before the World War. The results achieved have been attained only through the most drastic economy and the heartiest co-operation of the officials and other employees.

MR. BLACK A PIONEER

As indicated previously, Mr. Black's latest term of service as an executive of the Market Street Railway dates from July 1, 1922. His connection with the system there dates back to 1907, when he was called to take active operating charge of the property. This connection terminated in 1916, when he resigned as vice-president and general manager to become purchasing agent for the Allied Ordnance Department. Later he was commissioned in the United States Army and went overseas as assistant chief of ordnance in the American Expeditionary Forces. Before he went to San Francisco Mr. Black was vice-president and general manager of the Metropolitan Street Railway, Kansas City, Mo., as well as vice-president of the Kansas City Electric Light Company.

Mr. Black was graduated from Princeton in the arts course, and after a postgraduate course in engineering in that university he entered the employ of the Brush Electric Company and later went with the Westinghouse Electric & Manufacturing Company. He has been connected with Ford, Bacon & Davis, New York, since 1899, and is at present a vice-president of that firm, in which capacity he will continue.

In 1915 Mr. Black was president of the American Electric Railway Association.

Morton H. Dean Succeeds Alexander Jackson in Newark

Morton H. Dean has been appointed superintendent of time-tables Public Service Railway, Newark, N. J., succeeding Alexander Jackson, whose resignation from this position was mentioned in ELECTRIC RAILWAY JOURNAL issue of April 11, page 602. Promotion to be the head of the time-table department comes to Mr. Dean as the culmination of nearly twenty years experience in this work. His connection with the Public Service Railway dates from 1906, when he entered its employ soon after his graduation from school. During this entire time he has always been in the schedule department.

Prior to his promotion Mr. Dean occupied the position of chief clerk of the department. In this capacity he had become thoroughly familiar with the many perplexing problems connected with the preparation of time-tables for nearly 100 different car lines.

William Owen has succeeded John H. Clark as claim agent of the Oakwood Street Railway, Dayton, Ohio.

G. W. Comfort Manager at Poughkeepsie

G. W. Comfort has been appointed general manager of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., to succeed C. A. Brooks, who resigned recently to join the force of Fitkin & Company, New York, in charge of this railway property.

The appointment of Mr. Comfort to this post is another instance of a promotion from the ranks of the J. G. White Management Corporation, which operates this property. Fifteen years ago or, to be exact, on Feb. 14, 1910, Mr. Comfort started in the employ of the J. G. White Management Corporation in its New York office as stenographer. He was advanced from time to time as secretary to various officials, finally becoming executive secretary and general assistant to the president and vice-presidents of the J. G. White Management Corporation, being closely associated with Joseph K. Choate, vice-president.

G. W. Comfort

Part of Mr. Comfort's duties in this capacity consisted in accompanying his superiors on general inspections of public utility properties and in assisting Mr. Choate as receiver of the Aurora, Elgin & Chicago Railroad and the Morris County Traction Company. On three different occasions Mr. Comfort accompanied Mr. Choate to Nicaragua, Central America, for the purpose of inspecting and reporting on the operations of the Ferrocarril del Pacifico de Nicaragua, which property is also under the supervision of the J. G. White Management Corporation.

Mason B. Starring Succeeds C. N. Black at San Francisco

Mason B. Starring, New York, president of the United Railways Investment Company, holding organization for the Market Street Railway, San Francisco, Cal., has been elected president of the company at San Francisco to succeed Charles N. Black, resigned.

Mr. Starring is president of the California Corporation, California Railway & Power Company, Sierra & San Francisco Power Company and is identified in an official capacity with eight other large enterprises, including such well known companies as the Philadelphia Company, Duquesne Light Company, and the Pittsburgh Railways.

Mr. Starring was also elected to the board of directors of the Market Street Railway, succeeding to the vacancy caused by the resignation of B. S. Ginness of New York City.

W. S. W. Edgar has succeeded T. A. Ferneding as secretary of the City Railway, Dayton, Ohio.

Allen P. Parker is now president of the Waterbury & Milldale Tramway, Waterbury, Conn., succeeding C. H. Clark, deceased.

Abram A. Nesbitt has succeeded F. M. Kirby as president of the Wilkes-Barre Railway, Wilkes-Barre, Pa. **E. L. Hossler** has been appointed superintendent of transportation.

H. E. Ross, who has been auditor of the City Railway, Dayton, Ohio, for some time, was recently made treasurer of the company.

E. W. Jennison has been appointed engineer of maintenance of way of the Bangor Railway & Electric Company, Bangor, Me. In this capacity he succeeds W. E. Hooper, who had the title of chief engineer.

A. W. Allen of the McGraw-Hill publications has been appointed assistant editor of the ELECTRIC RAILWAY JOURNAL and *Bus Transportation* with headquarters at San Francisco. In 1917 he was engaged in private engineering practice in New York. He joined the McGraw-Hill forces in 1918 as metallurgical editor of *Engineering & Mining Journal*. Mr. Allen attended Plymouth Technical School and St. John's College, Cambridge, England.

Samuel Hutchinson of Kansas City has been appointed by Governor Baker of Missouri, on April 13, a member of the Missouri Public Service Commission. He succeeds R. H. Musser of Plattsburg. Hutchinson and Musser are Democrats. Governor Baker also plans to name a Democrat to succeed Commissioner Edward J. Bean, Democrat, of De Soto, Mo., who retired from the commission April 14. It is expected that this vacancy will be filled by a St. Louisan, as that city is without representation on the board. The Republican members of the board are: Thomas J. Brown, Charleston, Mo., chairman; Dudley Calfee of Jefferson City and Almon Ing, Poplar Bluff.

J. P. Ingle has been appointed receiver of the Jacksonville Traction Company, Jacksonville, Fla., to succeed the late E. J. Triay. Mr. Ingle has been connected with the company since 1922, going to Jacksonville from Haverhill, where he held the position of general manager with the Haverhill Gas & Lighting Company, also a Stone & Webster property. For eleven years previous to his Haverhill connection he had been in Keokuk, Iowa, where he went as superintendent of the Keokuk Electric Company. In 1914 he became general superintendent and in 1915 manager of the company. At one time he was associated with the Atlanta Gas Light Company, the Gas Light Company of Columbus, Ga., and the Baton Rouge Electric Company, Baton Rouge, La.

Another Job for Mr. Hawley

Head of Consolidated Car Heating Company Made a Member of Albany Port Commission

Cornell S. Hawley, the versatile president of the Consolidated Car Heating Company, Albany, N. Y., and member of the executive committee of the American Electric Railway Association, presided at the victory luncheon at Albany, on April 8, at which Albany celebrated its achievement in winning federal authorization for the deep river channel and creation by the state of the Albany Port Commission. Certainly Mr. Hawley will in no way be responsible if that city does not achieve the full measure of greatness as a port that rightfully belongs to it. As president of the Albany Chamber of Commerce and member of the Port Commission, Mr. Hawley has thrown himself wholeheartedly into the work of making the dream come true that Albany has cherished for many, many years, the dream of a port that will accommodate all but the very largest of the vessels that enter the port of New York. To accomplish this work $11,200,000 has been appropriated for deepening the Hudson for a distance of about 30 miles between Hudson and Albany by providing a 27-ft. channel at low water, 300 ft. in width. Five commissioners will control the work, four from Albany and one from Rensselaer. It will probably require five years to complete the undertaking. Just now the commissioners are looking for a port engineer.

C. S. Hawley

To Mr. Hawley the port work is the big thing. Even a contemplated trip to Europe, long anticipated by him, has been put aside in the better interest of Albany. It is a Hawley habit to follow through. Important as is Mr. Hawley's present port work, it is only one of the many activities of the man. He is not all business—far from it. His chamber of commerce work and his port work prove that, but even they are only instances. In the past he has been fuel administrator of Albany and during the war was treasurer of the Remington Arms U. M. C. Company. It has been said of him that he can "swing a mean mashie", and he has been known to do it at the Atlantic City conventions of the American Electric Railway Association. So Mr. Hawley has not forgotten how to relax, either.

Mr. Hawley was born in Waterford, Saratoga County, New York, and as a young man went to Washington, D. C., to study law. At Georgetown University he gained the degree of LL.B., and at Columbia law school, now the George Washington law school, he received the degree of LL.M. In 1898 he was admitted to the bar in Washington and in 1900 he passed the formal requirements for practicing law in New York State. But business beckoned to Mr. Hawley and he took a position with the Consolidated Car Heating Company in the sales department. Later he managed the company at Albany for four years and then became president of the Laconia Car Company. His work during the war has already been mentioned. After the war Mr. Hawley returned to the Consolidated Car Heating Company. Such, very briefly, is the record of this man, to whom business has been only the means to the much greater end of using his talents in the interests of his fellow man.

Joseph P. Autenreith, Jersey City, N. J., has been elected to succeed Harry V. Osborne as chairman of the Board of Public Utilities Commissioners of New Jersey. Former Congressman Charles Browne, Princeton, N. J., is the new member of the commission.

E. H. Maggard is president of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., in addition to general manager. Mr. Maggard was appointed general manager of the property early in 1916. At a very early age he entered the service of the Missouri, Kansas & Texas Railway at Dennison, Tex., as call boy and served until 1893, when he became a clerk in the freight office of the Southern Pacific at Houston. Later he became identified with the El Paso & Northeastern Railway at El Paso and in 1907 entered the employ of the Petaluma & Santa Rosa Railway as general freight and passenger agent. He continued in that capacity until promoted to the office of general manager, to succeed the late Elmer M. Van Frank, who was president and general manager of the company. Mr. Maggard succeeds Thomas MacClay as president.

Obituary

Amzi Smith, vice-president and general manager of the Johnston City Traction Corporation, Johnston City, Tenn., in 1923, died recently at Johnston City. He was vice-president and general manager of the Tennessee Eastern Electric Company. At one time Mr. Smith was connected with the street railway system in Washington, D. C.

Ralph C. Davidson, safety engineer American Abrasive Metals Company, died at his home in Plainfield, N. J., on April 15 after an illness of two days. He had been with the American Abrasive Metals Company since Jan. 1, 1918, and for ten years prior to that he was with the American Mason Safety Tread Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Watchful Waiting on Coal

Union Miners Unwilling to Reopen Jacksonville Agreement—Washington May Intervene

With one year's experience of the much-discussed Jacksonville agreement the status of the coal situation in this country remains practically unchanged. Although many opinions have been broadcast to the effect that some steps would have to be taken to relieve the coal operators of such overwhelming obligations as were part of the settlement made on Feb. 18, 1924, when the bituminous wage scale was renewed for a term of three years by miners and operators of the central competitive field, the fact remains that the agreement, binding the coal operators to a three-year contract at wartime wages, is in effect and is unlikely to be succeeded by any other settlement in the near future.

While it is evident that the union operators are in many instances being forced to close down their mines in the face of non-union competition, Illinois and Indiana are unwilling to come forward and seek an adjustment because it would put them in a weak position for bargaining with the union. They hope the union will soon weaken and ask a wage change. They prefer to bear the terrific inroads the wages make in their profits and work out quietly possible curtailments to offset the high wage expense. On the other hand, the miners in Ohio, Illinois, Indiana and Pennsylvania are unwilling to take the initial step which might lead to an amicable solution. Their labor leaders proclaim the Jacksonville agreement a panacea for the excessive production of the country, but the non-union mines in Kentucky and West Virginia are paying low wages, meeting the freight rates and forcing the union mines to live out of their capital.

The operators of Ohio and western Pennsylvania suppliantly asked a wage conference but President Lewis of the union refused.

It was recently stated that the administration at Washington, acting through Secretary Hoover, would shortly have a new coal policy ready. Just how this will affect the issue is problematical. The government sees the seriousness of the situation, but has made no indication that it will interfere in the matter. Embarrassment has been felt by Ohio and western Pennsylvania operators who have done the seeking, and the hands of the men are pretty tightly tied, since their leaders have political consequence to face.

In some districts the men have found employment in the steel plants, but in others operators are turning their mines over to the employees to manage and operate. These experiments in co-operative production have not proved altogether successful. In Indiana this plan has been condemned by officials of the union, who have moved to check what they term abuses of the system which involve the working of mines by union miners on shares and in violation of union laws.

John L. Lewis, president of the United Mine Workers of America, recently summed up the situation. He said that previous to the Jacksonville agreement the law of supply and demand had been defeated by a strike practically every year; that the Jacksonville agreement meant no strike and no accompanying boost in prices for the next three years, and this meant that uneconomic mines unable to take advantage of periodic famines and increased prices would gradually be forced out of the field. "This may sound like harsh medicine," he claimed, "but is just as harsh for the miner who has to find a new job and move his family as it is for the owner who has to abandon his mine. It was unsound national economics to keep 40 per cent too many mines in operation and 150,000 extra men in an industry which did not need them."

According to *Coal Age*, if union mines have been forced to close solely because they have been paying the union scale and not because they are inherently high-cost mines, then it is to the public interest that they be reopened, "but a wage cut carried so far that high-cost mines could be reopened admittedly would not be best for the country as a whole, nor to the union operators nor the union men." Further, it believes that a conference should recognize that some of the elimination of excess mines has been a good thing. Its effort should not be to get all the union mines into operation, but to take action calculated to encourage the best to run full time. All this will mean a change in the wage policy of the union. That magazine thinks, further, that the union could well afford to concede lower rates to those mines that could guarantee steady employment. A change in the policy of the United Mine Workers would mean that the union would attempt to obtain steady work and steady pay only for the number of men needed by the industry rather than to get some work and some pay for every miner. Meanwhile, conjecture and opinion go on and the Jacksonville agreement remains in effect.

Elimination of Waste in Industry

Hoover, Swope and Green Discuss Methods of Increasing Production by Collective Effort—Costs Can Be Lowered by Greater Efficiency in Manufacture

WASTE elimination and the minimizing of industrial controversy were discussed from the sides of employer, employee and the public at the first Industrial Round Table of the National Civic Federation, in New York, on April 11. Herbert Hoover, Secretary of Commerce, and Gerard Swope, president of the General Electric Company, gave the viewpoints of the public and of the employer respectively, while William Green, president of the American Federation of Labor, spoke regarding the attitude of labor toward industrial controversy and waste elimination.

Mr. Hoover's text was that the greatest opportunity for increased wages and higher standards of living for the worker lay in eliminating industrial wastes. These wastes can be reduced only by collective effort. "They contain," he declared, "the paradox that if we save collectively, we will have more goods and services to expend individually." Illustrating the possibilities, he commented on the fine showing of our railways in the last three years. They have handled a 14 per cent increase in gross operating expenses. Rates have been decreased more than 5 per cent, the hours of the workers have decreased and the wage has increased slightly. Service to the community has been immeasurably improved, and all this due to great effort in management and the co-operation of the employees and of the community itself. He cited also the waste elimination efforts under way in the construction industry as typical of effective effort.

He declared that there is hope that America is finding a solution of the problem of securing social satisfaction with the preservation of private industry, of initiative and full development of the individual. This is being brought about by recognition of the identity of interest of employer and employed and the effort to organize that identity in order to limit the area of conflict. Waste elimination is one of the subjects in which there is identity of interest.

MAKING THE EMPLOYEE THINK

Mr. Swope maintained that waste elimination can be greatly furthered if the thought of the workers can be directed to the subject. He related that in an organization of 60,000 workers, 8,000 suggestions were received in 1923 and 10,000 in 1924. Of these 5,000 had been put in practice, and $100,000 had been paid, over and above wages, to the workers who had made the suggestions. He stood, he declared, for lower selling prices of commodities and showed that lower prices are not incompatible with higher wages. Incandescent lamps, for example, are now cheaper than they were before the war, yet the earnings of the workers have increased 100 per cent. The "labor content" of each lamp, however, has been decreased. This has been brought about by more efficient methods.

Commenting on selling prices, Mr. Swope added:

"We have a great advantage in America in having a large population becoming constantly more homogeneous, speaking at all events one language, existing under the same political institutions, having common ideals and with a high standard of living. This makes it possible to market a standard product, bringing in its train the advantages of quantity production, in which field the manufacturing companies throughout the United States have taken the lead.

"The problem still before us is to reduce selling prices so as constantly to reach a larger and larger circle of buyers, and this means not only the advancement in manufacturing processes but also reduction in cost so as to enable us to distribute our product at a lower selling price. Reductions in cost do not necessarily mean increased profits to the manufacturer; they may, to a certain extent, but lower costs must sooner or later always be reflected in lower selling prices. Not only is this a fact as gained from experience, but it will be seen that this is very desirable from the standpoint of the manufacturer as the market is thereby enlarged, with the possibility of still further reducing the manufacturing and distributing costs."

He closed his remarks with a discussion of the larger value of workers' suggestions and of the relations between management and employee:

"The effect upon the organization of these suggestions by workmen is of even greater importance than the reduction in cost and the monetary rewards to the men, because of the stimulation to the men themselves and to the *esprit de corps* of the organization as a whole, because of the recognition that the workingman is a live, integral part of the business and may contribute to a greater extent than he has heretofore in its upbuilding. This gives the workingman a greater interest and keener sense of enjoyment from his work, as he feels that he has made a constructive contribution. The recognition that has come to him is not only appreciated but causes him to be respected by his associates."

ATTITUDE OF LABOR

Mr. Green declared at the outset that labor believes that production costs should be lowered through the promotion of efficiency in workmanship and management, the elimination of waste and the introduction of economy processes. Unreasonable competition is one of the primary causes of waste, leading even to a disregard of human life and human welfare. He cited a great basic industry (admitting after his address that it was the bituminous coal mining industry) in which, as the result of competition, there is at present shocking disorganization and human suffering. Since labor organizations cannot be destroyed, why not, he pleaded, "recognize their value and merit and accept from them the benefits they can give through their organized effort?"

The workers realize that their welfare in a great measure depends upon the maintenance of peace in industry. They have believed that it could better be maintained through collective bargaining. He insisted that efforts of employers to prevent the organization of workers is a waste of time, money and effort that should be eliminated. "Labor," he declared dramatically, "is not un-American. It is sound, constructive, practical and rational. It has been forced to take a militant attitude in order to maintain its very existence. It does not want to waste its energies in industrial conflicts. It understands fully the costs of industrial strife, but it is determined to assert its right to organize and bargain collectively, regardless of cost or sacrifice.

"I am confident that we can minimize industrial controversy through a proper regard and recognition of the rights of both employers and employees. The right of the employer to manage his industry, to control it and to receive a fair profit upon his investment should be maintained and recognized. The right of the employees to organize, to bargain collectively, to be represented in conference with employers, through their chosen representatives, is a right which should be readily accorded and completely recognized. A religious observance of these rights will do more to minimize industrial controversy than the application of any rule or formula.

"Supplementing the recognition of these simple rights must come understanding, co-operation and the manifestation of a mutuality of interest in the management and conduct of industry. Good faith and good will must be firmly established. Perfect candor must characterize the attitude and relationship of both employers and employees."

Fageol Gas-Electric Bus Makes Test Run

A trial run of the first Fageol gas-electric bus was recently made from Kent, Ohio, to Albany, N. Y., via Pittsburgh, Philadelphia and New York City. This was a 30-passenger single-deck bus built for the Capital District Transportation Company, a subsidiary of the United Traction Company, Albany. The bus and electrical equipment were assembled at the Fageol factory at Kent. At the time this was done it was not known that the bus would be run under its own power to Albany. The total mileage for the trip was 646, which was covered at an average speed of 18.3 m.p.h.

The start from the factory was made without any previous tryout of either mechanical or electrical equipment other than a short run of approximately 10 miles. En route a difficult climb to the top of Ligonier Mountain was made under very slippery conditions with nearly an inch of ice and snow on the road. It was found under these circumstances that the best results were obtained by starting the motors in parallel rather than in series. A very long grade was negotiated just beyond McConnellsburg, which took 25 minutes to ascend. In descending the grade the regenerative brake was used to good advantage. The bus was held down to a speed of about 5 m.p.h. and between 85 and 100 amp. of regeneration current was flowing continuously during the descent.

Demonstrations were made before the officials of the Public Service Railway in Newark and of the Third Avenue Railway in New York City. An interesting test was made on Lexington Avenue, New York City, where the bus was stopped midway on a 15 per cent grade

ELECTRIC RAILWAY MATERIAL PRICES—APRIL 14, 1925

Metals—New York

Copper, electrolytic, cents per lb.	13.50
Lead, cents per lb.	8.125
Nickel, cents per lb.	31.00
Zinc, cents per lb.	7.32
Tin, Straits, cents per lb.	50.50
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.35
Somerset mine run, Boston	2.125
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.90
Kansas screenings, Kansas City	2.75

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.425
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.10
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.50

Hardware—Pittsburgh

Wire nails, base per keg	2.85
Sheet iron (28 gage), cents per lb.	3.40
Sheet iron, galvanized (28 gage), cents per lb.	4.50
Galvanized barbed wire, cents per lb.	3.55
Galvanized wire, ordinary, cents per lb.	2.60

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.09
White lead (100 lb. keg), cents per lb.	0.1575
Turpentine (bbl. lots), per gal.	0.94
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	15.875
Rubber-covered wire, No. 14, per 1,000 ft.	$6.65
Weatherproof wire base, cents per lb.	18.50

Paving Materials

Paving stone, granite, 4x8x4, f.o.b.	
Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.82
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.00
Light copper, cents per lb.	9.125
Heavy brass, cents per lb.	6.50
Zinc, old scrap, cents per lb.	4.125
Lead, cents per lb. (heavy)	6.125
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	16.25
Rails (short), Chicago, gross ton	18.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	10.25

and started with the motors in series. The ascent was made easily with approximately 20 passengers.

Details of the equipment of this bus are given below:

Equipment	Pounds
Chassis, Fageol double-deck type..	.....
Body, single-deck street car type: total weight, less electrical equipment	12,390
Generator, GE-1098, Model 36-A-5; rated 125 volt, 200 amp., 1,200 r.p.m.	900
Motors, two GE-1079, Model 36-A-6; rated 125 volt, 85 amp. 1,550 r.p.m.	890
Controller, S-157, Form A, with wiring and resistance unit	100
Total weight	14,280
Reduction, dual drive, Timken worm	11:1
Wheels	34 in.

The following additional features were also included: Dual spring suspension without air shock absorbers; hot air heating system using radiator fan for supply of fresh air; thermostatic control of gasoline preheating device.

Municipal Railway Car Purchase Still Undecided

Authorization is being awaited from the Board of Supervisors of San Francisco, Cal., for the purchase of fifteen new cars for the Municipal Railway. It is understood that the new cars will be of a type similar to those purchased for use on the Geary Street line under the last appropriation. These cars were built by the Bethlehem Construction Company in San Francisco. They are 47.1 ft. long, 9.2½ ft. wide and have plywood veneer tops. They are of semi-steel construction, each with a capacity of 50 passengers.

It is understood that the cars will cost about $17,000 each. The railway bureau engineers of the San Francisco engineer's office urge that the money to pay for them be taken from the depreciation fund instead of financing the purchase through the sale of bonds. The cars are badly needed, but so far the suvervisors have not seen fit to act.

Rolling Stock

Pittsburgh Railways, Pittsburgh, Pa., has placed an order for 103 new cars. Of this number 83 will be multiple-unit one-man, two-man, low-floor, center-exit cars for city service. The remaining twenty will be of the same general type, but designed for interurban service.

Georgia Railway & Power Company, Atlanta, Ga., through the Atlanta Coach Company, a newly organized subsidiary, has ordered fifteen double-deck Fageol buses with General Electric gasoline-electric drive. Each coach will seat 58 passengers. The lower deck seats will be finished in leather, while the upper deck will be provided with slat seats. A new type of canopy top will act as a means of protection for the passengers against sun and rain. The coaches will be so arranged that they can be operated by one man, with the entrance at the front. The exteriors will be of the same shade of green that is used on the street cars. Instead of reaching the upper deck by a back stairway, the entrance will be through the inside of the coach and thence up the stairway. In this way one man can handle the passengers for both decks.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has ordered ten 25-passenger Fageol buses of the rear observation type for use out of Milwaukee on its Waukesha and Madison lines.

Track and Line

Owensboro, Ky.—It is reported that the contract for construction of an 84-mile railroad between Owensboro, Ky., and Elnora, Ind., to cost approximately $7,000,000, has been let to Paul Meredith, Indianapolis contractor. The road will be known as the Owensboro, Rockport & Chicago Railway. The project, backed by English interests, includes construction of a combination railroad and highway bridge across the Ohio River at Rockport, Ind. References to this project have been made in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 2 and Dec. 27, 1924, pages 180 and 1089.

Iowa Southern Utilities Company, Centerville, Iowa, is planning extensive improvement and repair work on the tracks of its Burlington railway system. D. D. Bensinger of the Iowa Southern Utilities Company said that material was being purchased for maintenance of the tracks.

Spokane & Eastern Railway & Power Company - Inland Empire Railroad, Spokane, Wash., have been authorized by the trustees to spend $125,000 on new bridges, building and track improvements. This sum is $50,000 larger than the budget outlay for improvements authorized last year. In addition to the budget totals, trackwork, bridge repairs and tie replacement to the amount of $125,000 were begun in March. This includes the placing of 75,000 new ties and various items of bridge and structural upkeep.

Power Houses, Shops and Buildings

Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., has practically completed plans for rebuilding the carhouse destroyed by fire several weeks ago. It is thought that the last set of plans submitted by the architects, Shourds-Stoner Company, will be selected. According to preliminary estimates the structure will cost $50,000. At the time of the fire the loss was estimated at $200,000.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, is spending $175,000 in betterments and extensions for its power plant in Findlay.

Trade Notes

J. J. Flaherty, formerly in charge of welding for the Boston Elevated Railway, Boston, Mass., has accepted an appointment as director of sales for the Page Steel & Wire Company, Bridgeport, Conn.

Eisemann Magneto Corporation, New York, N. Y., has announced that A. E. Berdon has become associated with it in the capacity of assistant chief engineer. Mr. Berdon's engineering experience has been varied. He was at one time associated with the Self-Feeding Vaporizer Corporation, Dodge Brothers at Detroit and the Remy Electric Company at Anderson, Ind.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has announced that W. H. Ivers has again become associated with it. He will be located at St. Louis and will represent the territory formerly represented by W. J. Roehl.

General Electric Company, Schenectady, N. Y., has announced that 43 employees have received Charles A. Coffin Foundation awards for having made most signal contributions toward the increase of the company's efficiency or progress in the electrical art during 1924. Twelve of the prizes were won by shopmen, five by foremen, fifteen by engineers and seven by commercial men. Four special awards were made for the presentation of papers at company meetings. With each certificate of award there is a prize of $250.

Wagner Electric Corporation, St. Louis, Mo., has announced that J. A. Gelzer, for many years connected with the Wagner automotive sales department, has been appointed sales manager of the automotive division, with headquarters at the home office.

New Advertising Literature

Julius Andrae & Sons Company, Milwaukee, Wis., has announced that its new electrical supply catalog No. 58 is available for distribution.

Crouse - Hinds Company, Syracuse, N. Y., has issued Folder No. 22 and Bulletin No. 2070 on condulets for stock bin installation.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 331, containing useful information on track materials and contractors' equipment.

Northeast Electric Company, Rochester, N. Y., has just published an elaborately issued circular on its starting, lighting and ignition apparatus as well as its horns and speedometers for buses and other automobiles.

Templeton, Kenly & Company, Ltd., Chicago, Ill., have issued a bulletin, called "A Safety Suggestion," concerning all types of double-acting tripping track jacks.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has reprinted a paper entitled "The Advantages of Buying Renewal Parts from the Manufacturer Most Interested in Their Performance," presented by H. R. Meyer at the annual meeting of the Pennsylvania Street Railway Association. The purpose of Mr. Meyer's paper was to present some ideas that would help further to decrease maintenance costs, secure more reliable performance and bring about a general lowering of first cost of renewal parts and the original equipments. The author discussed briefly the economies of the subject involved, quantity manufacture, overstocking due to internal manufacture and service in their relation to renewal parts.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, April 25, 1925 *Number* 17

Directors Familiar with Transportation Deserve Re-election

ELECTRIC railway companies are interested in the election which will take place May 20-22 of directors of the Chamber of Commerce of the United States. Under the two years' term of directors of that body, half of the membership of the board is chosen each year, and the selection is made by the national councillors representing the various organizations in the membership. This paper has had occasion in the past to refer to the valuable work being done by the United States chamber in helping to solve national transportation problems. The consideration which this organization has given to electric railway questions has been of material aid to the electric railway industry.

The list of nominees for the office of director at the May election, recently made public, shows that several of the present members of the board are closely allied in one way or another with the electric railway industry and would be especially well qualified to serve the chamber because of their knowledge of local transportation topics. This applies particularly to Paul Shoup of San Francisco, a director of the foreign commerce group; P. H. Gadsden of Philadelphia, a director from the second election district; A. J. Brosseau of New York, a director of the manufactures (fabricated productions) group and A. L. Humphrey of Pittsburgh, a director of the transportation and communication group. No discrimination is intended in favor of these gentlemen and against other candidates for the office of director, to say that they deserve re-election. Mr. Gadsden's candidacy for this office was mentioned several weeks ago in these columns.

Railway men who expect to represent their chambers of commerce at the annual meeting in Washington can well support these candidates. If the railway man does not expect to go himself to Washington, he can sincerely indorse them as able, conscientious workers who understand transportation problems to the official delegate from his chamber or board of trade.

Technical Sessions Are Needed at Conventions

GENERAL utility subjects formed the entire program at the annual meeting of the Wisconsin Utilities Association recently held in Milwaukee and reported in this issue. This is a departure from established practice. In the past sectional sessions of the association have been held for the railway, gas and electric men. President Neff called attention to this change in the program and explained that meetings of the individual sections had been held separately during the year in order that the time of the annual convention could be devoted entirely to important problems of public relations, utility regulation and finance.

Modernization and merchandising transportation, on the other hand, are subjects which occupy first place in the minds of all progressive railway managers, and which apply specifically to the railway business. Then, too, there is a pressing need for the discussion of technical subjects, since even with its 40 years' experience the industry is always developing new methods and new equipment. Consequently such things as transportation practice, traffic congestion, bus operation, track design, car design, and maintenance methods are topics of extreme importance to the electric railway man.

If engineers and operating men are to be encouraged to attend meetings of utility associations, every opportunity must be given them to interchange ideas and compare methods. For this reason technical sessions for the railway men must not be overlooked if their support is to be retained by the state and sectional associations.

Close Relation Between City Planning and Transportation

CITY planning of an intelligent sort evidently is more needed now than ever before. When there were no automobiles and but few high buildings street congestion was almost unknown and almost any arrangement of city streets was practicable. In those days city planners thought their one great object was to produce beautiful vistas. An imposing building or monument was placed at the end of a broad avenue or in a circle from which radiated a number of avenues. The original plan of Washington, D. C., by Major L'Enfant and the reconstruction of central districts of Paris under Napoleon III belong to this period.

Apart from the esthetic side of city planning, two allied main problems are to be solved in the development of large communities. One of them is how best to direct the development of the community so that transportation problems do not become too acute. The second is to solve those transportation problems which exist and provide for solution of those in the growing sections of the community. Of little use is a fine city architecturally if its inhabitants cannot get about easily as the demands of business and social engagements dictate or in which commodities cannot be transported quickly and economically.

Four causes have largely brought about these new problems. First is the great increase in tall buildings, containing often thousands of tenants who have to use streets and transportation facilities designed when the abutting buildings hardly exceeded four or five stories. Second is the drift of population to the cities. Third, modern living and business conditions call for more local transportation from the average individual than in former years. Fourth is the great increase in number of vehicles on the streets, owing partly to an added demand for transportation and partly to the recent development and present extensive use of the private vehicle. Obviously, then, if the people in our cities of 50 and 100 years from now are to get around with any sort of convenience and dispatch, steps must be taken promptly to change the trend toward constantly greater street congestion, which has been so conspicuous during the last 20 years.

At the city planning convention held in New York during the present week much consideration was given to transportation. Broadly speaking, three remedies, in addition to more and better transportation facilities, were suggested. These were decentralization of business, limitation of future heights of buildings and traffic regulation. There was also a clear recognition by the delegates present of the close relationship of good transportation to better city living conditions. Altogether the convention emphasized the need of the very closest co-operative work between the local railway and those civic interests endeavoring to bring about better city development.

Texas Electrification Another Example of Co-operation

DUPLICATION of effort always is wasteful and frequently results in serious losses. On the contrary, proper planning may make possible a much more intensive use of an existing plant, with correspondingly good financial results. The electrification of the Missouri-Kansas-Texas Railroad between Dallas and Denton, described in this issue, is an illustration of the latter viewpoint. Handling all the business that the steam railroad has been able to develop after many years, the addition of a comparatively small investment in power distribution equipment and rolling stock has made it possible to use the steam railroad facilities for all the purposes of an interurban railway as well. The two services do not conflict, and a new field of usefulness has been exploited to the benefit of public and investor alike.

Conditions of a similar sort exist in many parts of the country. The steam railroad is not fitted to render the type of frequent service that is demanded by local passengers. Usually its management has had no desire to go into the local business with its steam trains. This was the universal idea 25 years ago. As a result, many interurban electric railways were built to give this type of service, thus meeting a demand of the inhabitants along the route. Generally speaking, there was not sufficient traffic to justify the construction of two separate and competing lines, for either track would have had capacity to handle it all. Even where the traffic was too great for a single-track line, the construction of a second track on the same right-of-way would have given much more capacity than to build a second single-track line for competitive purposes. The first cost and the operating expenses would be decidedly less for the system with joint steam and electric service.

Operation of the new line will be watched with much interest, as there is in it the promise of extending this same method to a much greater extent elsewhere than has been attempted in the past. It is to be hoped that this solution of the local interurban transportation problem will be as good as present conditions indicate. With several months' operation, the statement is made that it is successful far beyond any expectations.

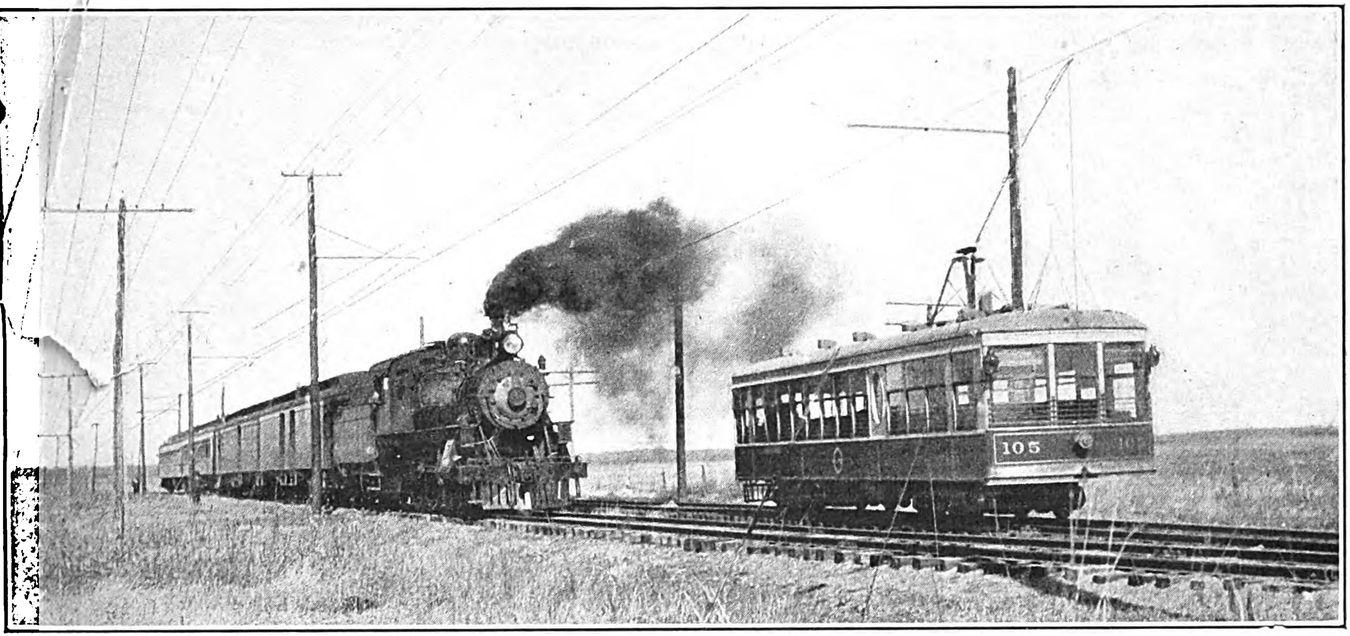
Recent Bus Proposals Command Attention

UNUSUALLY significant bus news has been contained in recent issues of ELECTRIC RAILWAY JOURNAL. One may or may not agree with the ideas behind all of the undertakings that are proposed, but one can not ignore them as news. A complete recapitulation of the proposals at this time is unnecessary. It is their magnitude and geographical distribution that are significant. Among the cities involved are New York, Kansas City, Cleveland, Detroit, Atlanta and Denver. The New York matter is still very much up in the air, but all of the others give promise of early fruition. Into the details of all of them it is impossible to go, but it is important to note that in general 10-cent fares are provided. In New York City the proposal of the New York Railways would carry a 5-cent fare on crosstown lines, but these lines are unusually short.

After all, the significant thing is that the railways more and more are growing appreciative of the possibilities of the bus. In the New York Railways case Receiver Sheeran is to be particularly commended for his foresight. His system has labored under the tremendous handicap of a receivership. It has in the past been criticised on the score of the condition of the physical property and the slowness of operation, but Mr. Sheeran has been hampered in his work by lack of funds with which to correct defects of which he was quite conscious, and has been prevented from attaining as high a degree of perfection in getting cars over the line as he desired because of increasing street congestion, a phase of operation in which the police are now giving a greater degree of co-operation. With the lifting of the New York Railways receivership, set now to be consummated on May 1, Mr. Sheeran will be in a position, if he is given half a chance by the New York City administration, to restore this system to its proper place as a part of New York's transportation scheme. The Kansas City Railways also operates under the limitation of receivership.

Similarly the bus proposal of the Third Avenue Railway, New York, calls for 5-cent and 10-cent lines. This system, perhaps not quite as sorely beset as the New York Railways, also is handicapped with the 5-cent fare. Its management is no less cognizant of the needs of the city than is that of the New York Railways.

As indicated previously, one does not have to agree with the proposals in all their details to recognize the appeal that they make from this point of view of news. They do, however, compel reflection. In the past, of course, there has been much justifiable complaint on the part of the railways of their inability always to earn an adequate return. That is an important point. The railways can no more afford to operate bus lines, at a loss than they can railway lines. In developing their plans for utilizing the bus the railways will have to be careful that the mistake of early electric railway days is not repeated—the mistake of contracting to furnish service that may never be made to pay, even with application of the most intensive selling methods.



Interurban Car of the Texas Interurban Railway on a Siding to Allow a Katy Steam Train to Pass on the Main Line

Steam Line Electrified to Furnish Interurban Service

By B. F. Cooke

Superintendent of Power Texas Interurban Railway
Dallas, Tex.

The Texas Interurban Railway Uses the Tracks of the M-K-T Railway Between Dallas and Denton — The Same Tracks Are Used for Steam Railroad Freight and Passenger Service — High-Speed Catenary Construction and Supervisory-Controlled Substations Form Principal New Work — Method of Operation and Contract Between the Two Companies Are Described

ONE of the most interesting recent developments in the electric railway field is the joint use by both steam trains and electric cars of an existing steam railroad track. This has been accomplished by the electrification of the Denton division of the Missouri-Kansas-Texas Railroad of Texas, between Dallas and Denton, which recently was completed by the Texas Interurban Railway. Interurban service between these terminals was begun on Oct. 1, 1924.

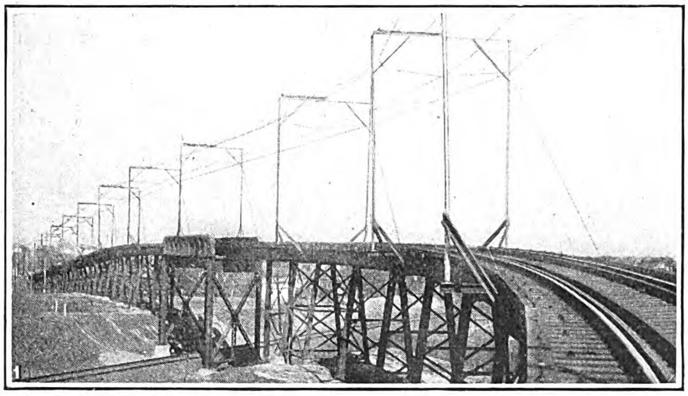
The Dallas-Denton interurban serves Dallas, which has a population of 160,000; Denton, with a population of 7,626, and four intermediate towns with populations ranging from 300 to 1,000. The population of the territories served averages 1,200 per square mile. Garza is the location of a new dam site for a water reservoir for the city of Dallas, and at present a thousand workers are employed on the project. Denton is the county seat of Denton County and the home of the College of Industrial Arts, a large school for women, and the North Texas Teachers' College. These schools have a combined enrollment of nearly 4,000 students.

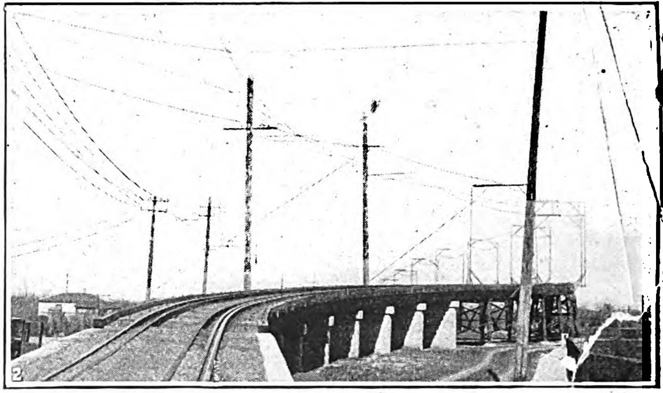
The distance between the terminals is 38.66 miles, of which 33.48 miles is on the steam railroad company's tracks. From the interurban station at Dallas to the city limits the interurban uses its own tracks and those of the Dallas Railway, which operates the city lines in Dallas. From the city limits to Texaco, where the interurban tracks connect with the M-K-T Railway, 1.5 miles of new track was built. In Denton the interurban leaves the railroad tracks at Oak Street and runs over its own tracks to the interurban station, which is located on McKinney Avenue in the business district. Several additional sidings were built to accommodate meeting trains along the line of the railroad between Dallas and Denton. On all new work 70-lb. rails were used, while the steam road uses 66-lb. rails.

Two trestles were built by the interurban company just outside of Dallas. One of these, which is approximately 400 ft. long, is of pile construction. This spans Cedar Springs Creek and furnishes an underpass for a proposed highway. The other trestle, which is approximately ¼ mile long, is of steel construction supported by concrete pilasters. It spans a small creek and furnishes an underpass for a country road and also the St. Louis-Southwestern Railroad. The trestle work gives an ascent to the overpass on a 5 per cent grade, along with a 20-deg. reverse curve. Both of these were necessitated by the existing street and railroad grades. This latter trestle cost approximately $45,000.

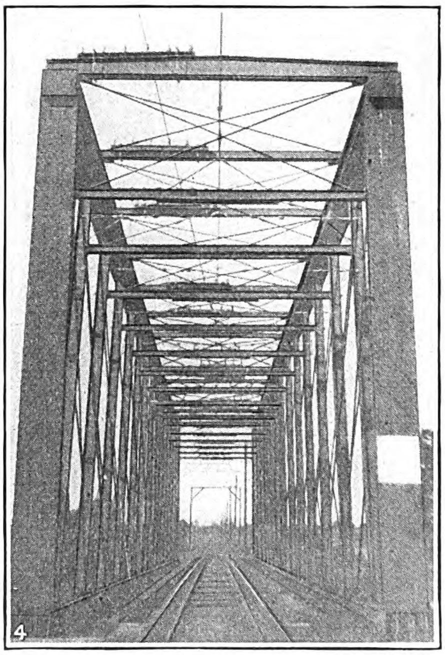
The location of the electrified section of the steam railroad and the connections for reaching the centers of both cities are shown on the accompanying map.

The new work was done by the Texas Construction Company, which concern also built the Dallas-Terrell line. Apart from the comparatively small amount of track construction necessary, the principal expense was

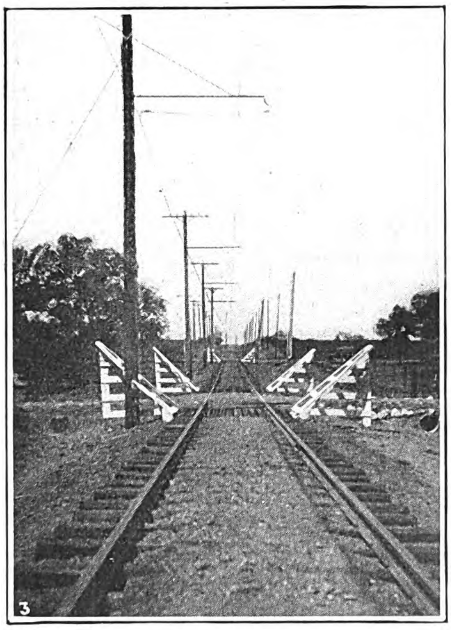

1

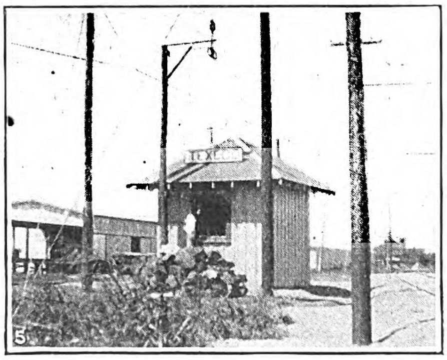

2

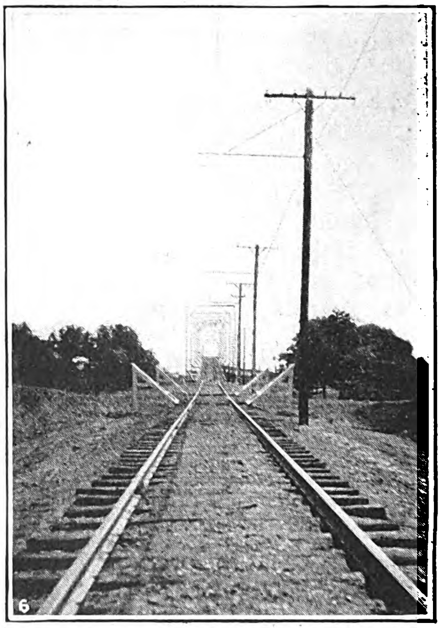
New Construction on the Line of the Dallas-Denton Interurban

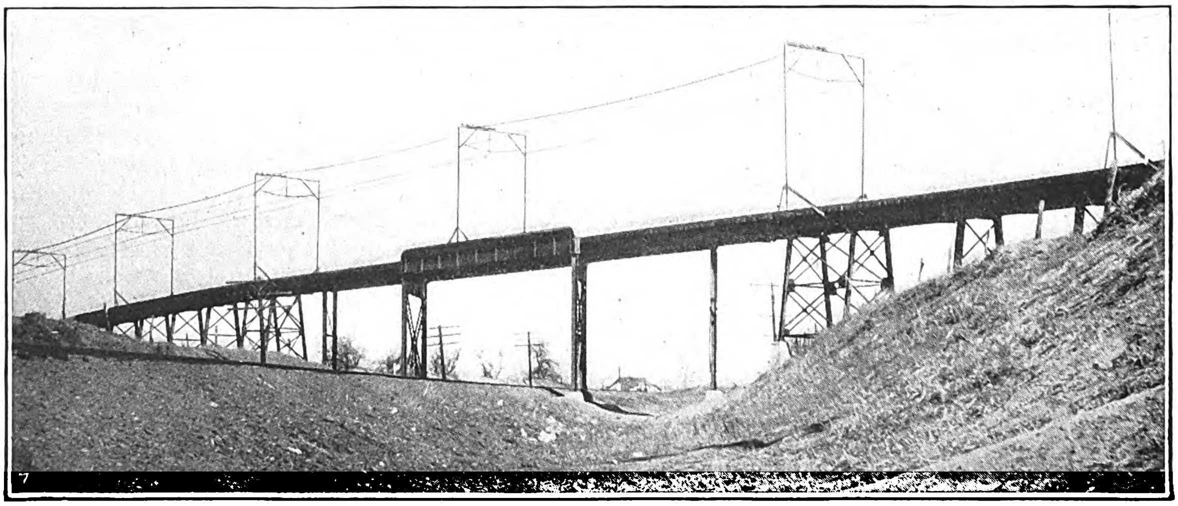

4

1 and 2. A trestle outside of Dallas spans a creek and furnishes an overpass for a steam railroad.
3. Cattle guards at Arroyo Street.
4. Bridge over Hickory Creek.
5. Dispatcher's office at Texaco.
6. Northern approach to Cotton Belt overpass.
7. Main span of overpass over Cotton Belt Railway near Dallas.


3


5


6


7

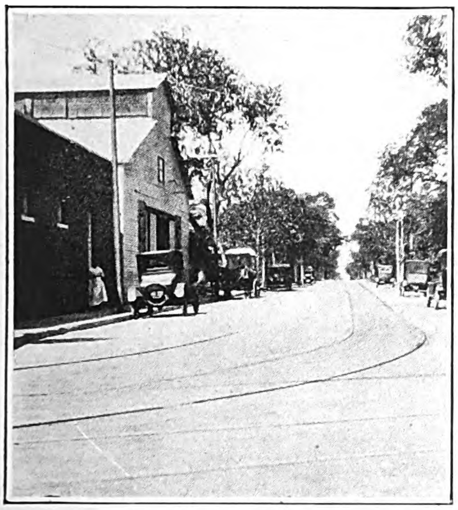
for the construction of the contact line and power distribution circuits. Power is furnished by four substations. One of these is located 1 mile from Dallas and is manually operated, while the other three are automatic. They are located respectively 13.5, 24.5 and 36.5 miles from Dallas, leaving a 2-mile stub feed on the Denton end. The manually-operated station is owned and maintained by the Dallas Power & Light Company, which also furnishes power for the operation of city and interurban cars on other lines. This station contains one 1,000-kw., 600-volt d.c. motor-generator set supplied by the General Electric Company, and has space for two additional machines of the same rating.

The three automatic substations, which also were supplied by the same manufacturer, are owned and maintained by the interurban railway. Power for these stations is furnished by the Texas Power & Light Company from its 60-kv. high-tension line which serves this territory. As shown in one of the illustrations, the automatic substations are of the semi-inclosed type. The high-tension structures, which are of the outdoor type, are used to serve the small towns in their vicinity as well as to supply the railway with power. The converter and switching equipment are housed in a brick structure 20 ft. by 20 ft. inside. Louvers in the walls near the floor and vents in the roof can be opened and closed as necessary to regulate the room temperature and provide adequate ventilation. The voltage is stepped down from the high-tension side through a HJTH three-phase-six-phase 300-kva. transformer, with "Y" connected primary and diametrically connected secondary. This transformer delivers alternating current at 445 volts to a 300-kw. rotary converter, which changes it to 600 volts d.c. The auxiliary equipment of each substation includes a.c. and d.c. lightning arresters, a 5-kva. control power transformer, 445 to 220-110 volts, and the automatic switching equipment for the control of a rotary converter. One of the innovations in the automatic equipment is the use of time delay relays. These afford a more definite and wider range of time settings than the oil dash pot relays used in earlier stations.

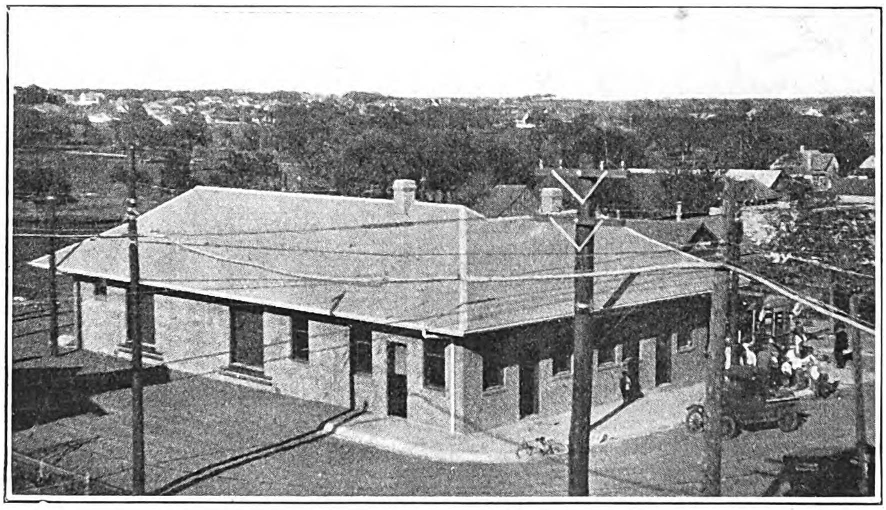
Each station has a ¾-in. galvanized pipe running from inside the building underground to a post near the track, where it is brought up to a convenient point and equipped with a short hose for connection with the compressed air tank on the railway line car. This line car makes an inspection trip once a week and stops at each station so that the inspector can blow out the machinery. The same outfit is available for air-brush painting the converter winding annually.

The permanent negative return from the rails to the station consists of a 1,000,000-circ.mil bare copper stranded cable run under ground in 2-in. galvanized pipe, bonded at the joints. A brass wiping cap was screwed on at each end of the pipe and a joint wiped to the copper cable. This includes the pipe in the return circuit in addition to protecting the copper from mechanical injury. The copper conductor is soldered to five No. 0000 cross bonds connecting to the rails. The entire track is bonded with No. 0000 ribbon brazed bonds, with No. 0000 cross bonds tying the two rails together at every feed-in tap.

The positive feeder between station and trolley wire feeder consists of a 750,000 circ.mil lead-covered copper cable, insulated for 3,000 volts. This cable is also run through a 2-in. galvanized conduit which was run from the station under a paved highway and up a pole to a pothead just below the trolley wire feeder. The iron conduit is considered an adequate protection against lightning. However, a Garton-Daniels panelboard arrester was installed on the pole to protect the cable from lightning. The 3,000-volt insulation was used as an extra precautionary measure, and the usual precautions were taken to protect both cable and conduit from electrolysis.



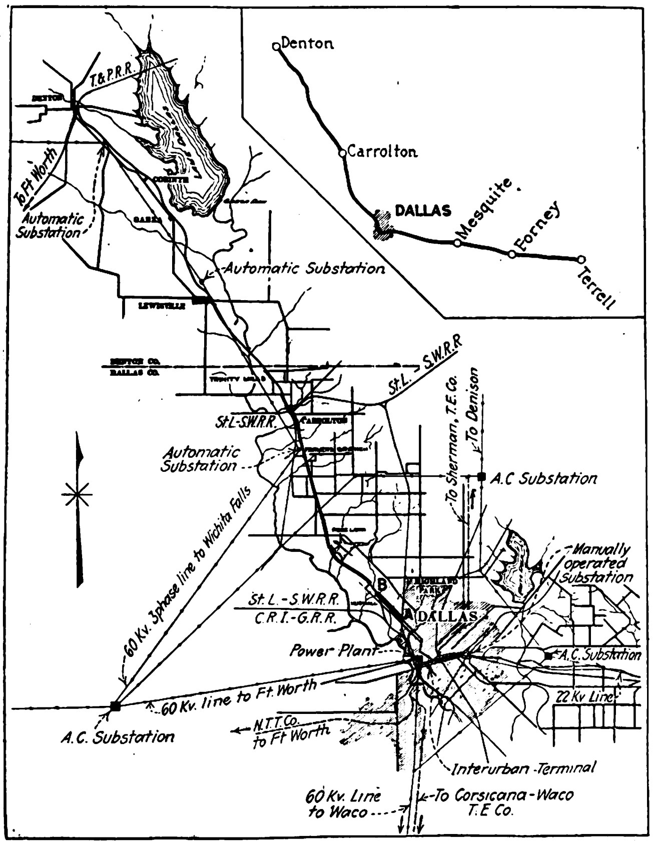
Track at Fairmount and McKinney Avenues, Denton



This Interurban Station at Denton Was Built by the Electric Railway Company

Five-Point Catenary Suspension Used

The overhead system is of the catenary type with five-point suspension supported by single 40-ft. poles set 9 ft. below the top of the rail, and spaced approximately on 150-ft. centers except along the tracks of the interurban company near Dallas and also near Denton, where direct suspension is used with 100-ft. pole spacing. Spacing between individual poles, however, is governed by existing conditions. The poles are of Southern longleaf yellow pine treated by the Rueping process. All poles are back-guyed, using never-creep anchors. Storm guys are placed every half mile and at each end of curves. The trolley wire is No. 0000 grooved copper supported by 7/16-in. Siemens-Martin double-galvanized stranded steel. The trolley wire is paralleled its entire distance by a 300,000-circ.mil feeder mounted on Pierce steel brackets. There are six feed-in taps to the mile. A Garton-Daniels lightning arrester is installed at each feed-in tap. Corrugated cast-iron plates were set under the bases of the poles, and a ¾-in. galvanized pipe screwed into the plate and extending 6 in. above the ground was used for lightning arrester grounding. A brass cap screwed on the end of the pipe afforded a convenient means of connecting the ground wire. The ground wire was also tapped and soldered to the rail cross bonds.



Of the 38.66 Miles of Interurban Route Between Dallas and Denton, Texas, 33.5 Are Electrified Steam Railroad

TELEPHONE DISPATCHING IS COMBINED WITH SUPERVISORY CONTROL

A telephone line, consisting of two metallic return circuits, extends from Denton to Terrell, the terminal of another interurban railway operated by the same management, by way of Dallas.* One of these circuits, known as the dispatcher's line, is normally used for dispatching trains over both the Denton and Terrell divisions. Under normal conditions the dispatcher listens in on this line at all times. The other circuit, which is known as the commercial line, is normally used for commercial purposes and for the supervisory control of the automatic substations on the Denton division.

In connection with the supervisory control system a third line wire is used. Western Electric selector apparatus is used on both the commercial and dispatcher's circuits. Each line is equipped separately with key cabinet and keys, apparatus cabinet and storage battery. The commercial line also serves as an emergency line for dispatching. In case of trouble on one line the dispatcher plugs in on the other. The telephones at the various booths and way stations along the line are equipped with jack boxes and plugs which permit plugging the instruments in on either line.

The train dispatcher has charge of the automatic substations through the supervisory control system. He also serves as telephone switchboard operator for the commercial line. For instance, if Denton wanted to talk to Terrell, Denton would plug in on the commercial line and ask the dispatcher to ring Terrell. The dispatcher would then plug back on the commercial line for the conversation, having rung Terrell on this line. Each way station is equipped with two selectors, one for each line.

Use of supervisory control for operating the automatic substations has been found to have several advantages over straight automatic operation. Three selector keys and two signal lights, one red and one green, are used with each station. One key is used for starting, one for stopping and the third for turning the station over for automatic operation. The signal lights indicate whether a station is running or shut down, red indicating that the station is running and green showing that it is stopped. A bell in the office rings whenever a change in the lights takes place, informing the dispatcher that a station is either starting or stopping. These signal indications are a great help in preventing delays in train service, due to lack of power. In case a station shuts down when one of the protective devices functions or if there is trouble on the high-tension line, the dispatcher is immediately informed. Usually he can get a trouble man on the job before a delay results. Without the signals he would not know of the trouble until the trains had become delayed, and not then would he be able to tell which station was out. With the signal lights he knows which stations caused the trouble or if it is on the high-tension line. In the latter case he can notify the power company. Were it not for this he might unnecessarily send out a trouble crew of the interurban.

Conditions peculiar to this system make advantageous the method of starting and stopping the substation by means of selector keys at the dispatcher's office. With automatic operation the cars will hold the substation on the line continuously through the day, even though it operates at an uneconomical load. This is because of the frequency of stops along the line. The time-delay stopping relay will reset due to the rush of current when a car starts, and before the relay has timed out another stop will reset it. To shorten the time setting so the station would shut down in this case also would cause it to shut down when a car makes a stop or is waiting on a siding. This would be more detrimental to the station equipment than continuous running.

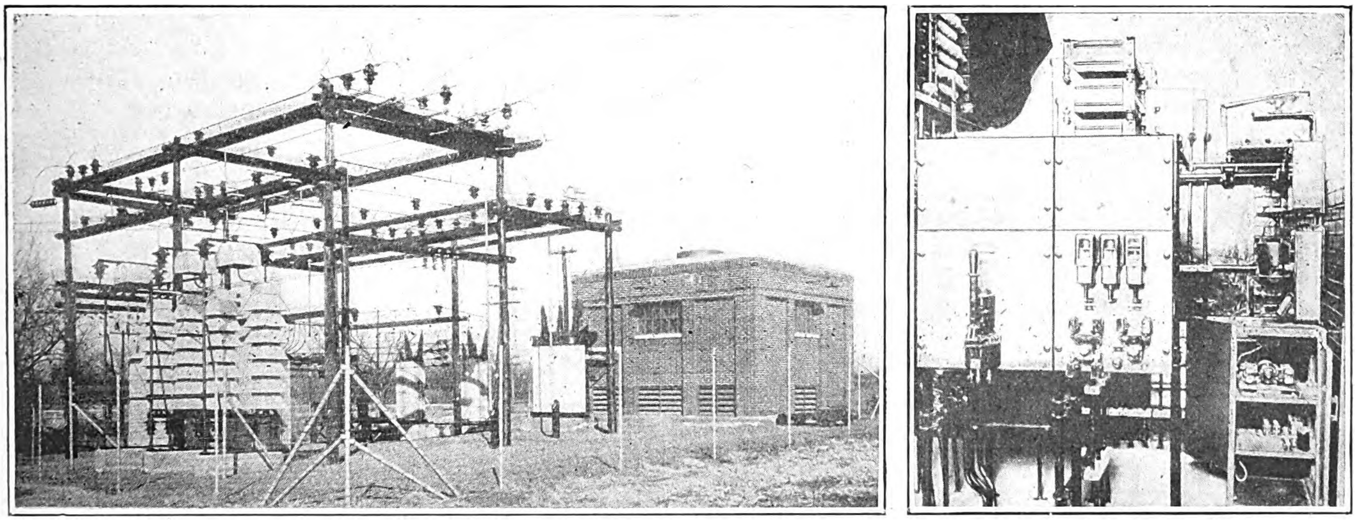
As each agent reports to the train dispatcher when a train passes his station, the location of trains is known by the dispatcher at all times. Accordingly he can tell where there is a demand for power and can operate the substations accordingly. A regular operating schedule has been prepared for the substations which can be used except when trains are late, which is a rare occurrence on this system. Ordinarily the dispatcher starts or stops the stations at predetermined times according to the schedule. In case of delays the dispatcher uses his own judgment and starts or stops the stations according to the demand for power. It is, of course, possible for the dispatcher to lock in all of the stations and keep them running until the trains get back on schedule time.

---

*The Terrell division is owned by the interurban company and is 31.5 miles in length. It was described in ELECTRIC RAILWAY JOURNAL for April 7, 1923, page 591.

Automatic starting relays, which consist of contact-making voltmeters, are placed in the substations and are set to start the station in case of trolley voltage reaching a certain minimum. The stopping relay will stop it in case of prolonged underload, regardless of the supervisory control system. Hence in case the dispatcher fails to operate the stations they will function automatically, thus eliminating the only objectionable feature of supervisory control.

It has been calculated that the use of supervisory control on this system will result in a saving of more than $1,000 a year in reduction of conversion losses, in addition to the resultant saving in maintenance and depreciation. Another feature is that by adding a key to the key cabinet and a selector with auxiliary equipment, practically any kind of a signal can be given by the dispatcher at any point on the line. At present no such signals are in use, but in case future developments demand them the equipment can be installed at a very small cost.



The Automatic Substations Have the Alternating-Current Apparatus Outdoors, While the Rotary Converter and Control Equipment Are Housed—At Right, Selector Type Supervisory Control Cabinet and Auxiliary Panel

ROLLING STOCK INTERCHANGEABLE WITH TERRELL LINE

Six light-weight one-man passenger cars and one express car comprise the rolling stock. The Terrell line has five passenger cars and two express cars of the same type. This makes a total of eleven passenger and three express cars for the two lines, all of which are interchangeable. Seven passenger cars and two express cars are required for schedule operation on both lines. Four passenger cars are needed on the Denton division, three passenger cars on the Terrell division and one express car on each. The remaining equipment is reserved for emergency use.

The passenger cars weigh approximately 32,000 lb. and are 45 ft. in length over all. They seat 52 passengers, and have a standing capacity of approximately 100. Each car is equipped with four GE-265-A 35-hp. motors, one K-35 controller, Brill 77-E-1 trucks with 26-in. wheels, a 15-cu.ft. air compressor, and straight air brakes with auxiliary valves for opening and closing the sliding door.

Fares are collected with the aid of a locked fare box mounted near the car entrance. A destination check having a number printed on each side is handed to each passenger as he drops his fare in the box on entering. This number corresponds with the number of the stop to which the passenger has paid his fare. The check is deposited in the box by the passenger as he leaves the car.

RAILROAD AND INTERURBAN SCHEDULES

All trains operate under the standard rule of the steam railroad, so far as they are applicable. In addition, special rules were drafted by the officials of the two companies to govern joint operation of steam and electric trains. Passenger trains, both steam and electric, are designated first class. Electric express cars are second class and steam freight trains are third class.

Interurban passenger service is provided hourly in each direction from 5 a.m. until 11 p.m. Two express cars are operated each way daily by the Electric Express & Baggage Company. The Missouri-Kansas-Texas Railroad operates four steam passenger trains and two freight trains daily. Two of the steam road passenger trains and all freight trains are operated at night. The schedule of running time between the city limits of Dallas and Denton averages 28 m.p.h. The 3½-mile run from the interurban station at Dallas to the city limits takes eighteen minutes, while the total running time for the 38.66 miles from Dallas interurban station to the Denton interurban station is one hour and 40 minutes.

Dispatchers of the steam railroad control the movement of all trains over the system. The office of the dispatcher is located at the junction of the railroad and the interurban tracks just beyond the Dallas city limits. The same dispatcher also handles trains over the Terrell division. Track switches at the junction are normally set for interurban operation. The dispatcher operates the switch for steam trains at the junction near Dallas, but one of the train crew has to operate the switch near Denton, so that it is necessary to stop steam trains at the latter junction.

Where meets occur between steam passenger trains and interurban cars the steam train has the right of way and occupies the main line while the interurban takes the siding. This procedure was adopted because it is much easier for the interurban car to take the siding. The car generally clears the main line in time to allow the steam train to pass on without making a stop. The trains, however, are required to approach meeting points under control. Each interurban car carries a negro porter who attends to flagging and who also assists passengers with their baggage.

So far the joint operation of the different types of trains over the same tracks has been successful beyond all expectations.

TERMS OF CONTRACT BETWEEN RAILROAD AND INTERURBAN

Under the contract for joint use of the railroad property by the interurban company it is provided that the Missouri-Kansas-Texas Railroad of Texas will care for maintenance, dispatching and supervision of the property jointly used, for which it will be reimbursed monthly by the interurban company. Provision is made for joint use of all railway property, including tracks, stations and appurtenances, by each party to the contract in such manner as if it were the sole owner, providing that such use shall not be inconsistent with the rights of either party.

Such employees as are jointly used are employed by the railway and may be discharged, for sufficient cause, upon complaint of the interurban and satisfactory employees engaged. Salary or wages of such joint employees are prorated between the two companies. It is understood that joint employees will serve impartially and without favor to either party.

The interurban is permitted to handle passengers, mail, freight and express, the only exception being that it may not handle freight in carload lots to or from Love Field industrial district, near Dallas. It may handle freight in less than carload lots and local freight, without special permission by the railway. Written consent must be obtained for carload lots. Express is to be handled subject to limitations of agreement between the railway and the American Railway Express Company.

The railway may permit other railways to use its lines, provided there is no interference with interurban use.

The interurban may not permit others to use the railway line without consent of the railway company. It is provided, however, that the interurban may extend its lines into territory served by the railroad and connect such service with its line using railway property.

The railway is to maintain its property in a condition suitable for operation. Such improvements, betterments and additions as are required for interurban use shall be made by the railway and paid for by the interurban at cost, plus 10 per cent for supervision. Materials used in such work will be paid for by the interurban at cost, plus 15 per cent for purchase, storing, accounting and freight. Such additions, improvements and betterments shall be the exclusive property of the interurban and maintained by it. The railway reserves the right at any time to purchase such improvements at reproduction cost new, less depreciation.

While the railway is charged with the maintenance of property jointly used, it is provided that if, upon written notice, it fails to make necessary maintenance or improvements, or if it is unable to act because of strikes, or conditions beyond its control, the interurban may do such work and bill the railway.

It is expressly stated that the contract for joint use of the railway line does not enlarge the duties and obligations of the interurban beyond those which would be imposed on it were it to construct, maintain and operate its own line. Federal, state and municipal laws and regulations applying to steam road operation do not apply to the interurban using the railway lines because of this joint usage.

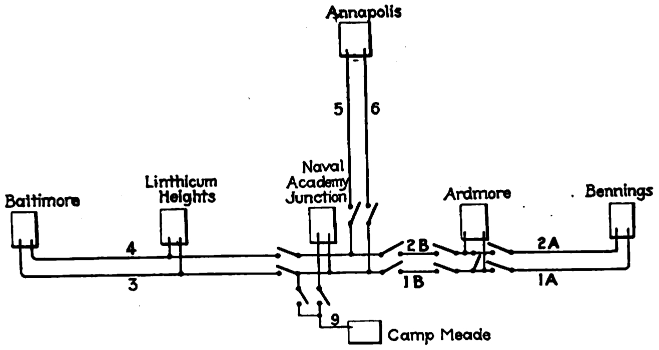
The interurban may use its transmission lines solely for current used in its operation.

Under the contract for joint use of the railway lines, the interurban is to pay in monthly installments a fixed annual rental equivalent to 3 per cent of the valuation of the railway property jointly used, as established by the Interstate Commerce Commission. It also pays monthly one-twelfth of 3 per cent per annum on all total expenditures, less the value of permanent retirements, made by the railway for additions, betterments and improvements of the jointly used property. Taxes on jointly used property are divided equally between the two companies.

In case differences arise, they may be submitted to a board of arbitration composed of three arbitrators, one chosen by each of the parties and the two so chosen selecting the third.

Parallel Transmission Lines Insure Continuity of Power Supply

POWER used in the operation of the Washington, Baltimore & Annapolis Electric Railroad and its subsidiary, the Annapolis & Chesapeake Bay Power Company, is furnished from the plant of the Potomac Electric Power Company, Washington, D. C. Energy is delivered from the main power plant to the Bennings substation, which is located alongside, and this substation is operated jointly by the Washington, Baltimore & Annapolis Electric Railroad and the Washington Railway & Electric Company. From this point the railroad has duplicate 33,000-volt transmission lines through to Baltimore and Annapolis.



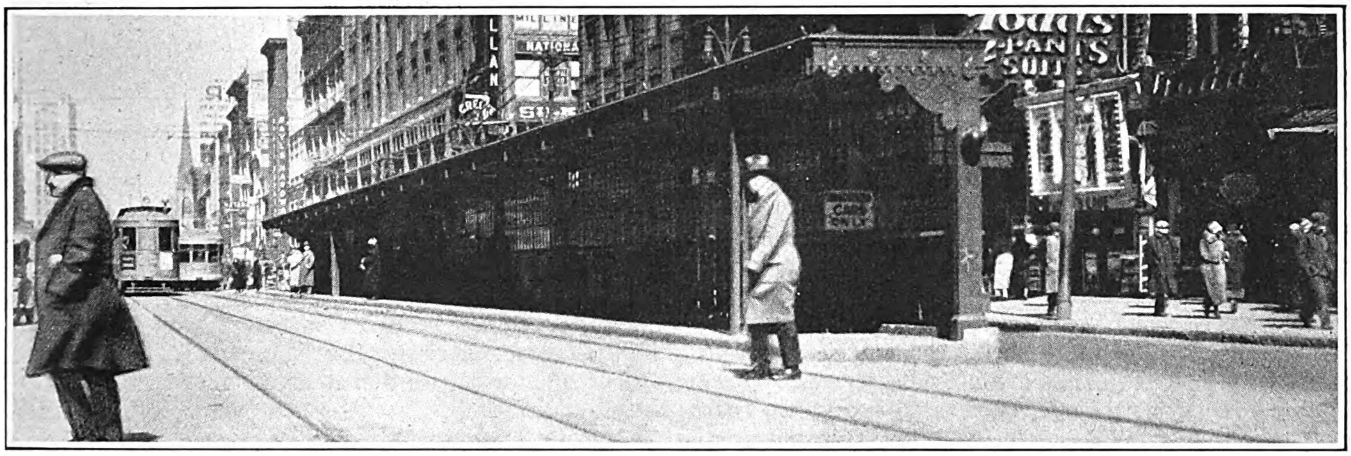
Transmission Lines of the W., B. & A. Electric Railroad Are Divided into Sections and Connections Provided for Emergency Use

Under normal operation one transmission line is used for the operation of the railroad and the other for the operation of the Annapolis & Chesapeake Bay Power Company, but in case of emergency either transmission line carries the entire load. These transmission lines are divided into sections as shown on the accompanying plan and interconnected at Ardmore and Naval Academy Junction substations. It is thus possible to send power through to Baltimore and Annapolis by using alternate sections of the two lines.

Shelter Combined with Island Platform

Detroit Department of Street Railways Erects Roofed Loading Station at Busy Point on Woodward Avenue—Structure Includes Raised Platform 220 Ft. Long—Double Berthing Adopted for Two Car Lines—Vehicle Traffic Has Been Accelerated

By G. A. Peterson
Construction Engineer Department of Street Railways, Detroit



This Covered Shelter in Downtown Detroit Protects Waiting Passengers Against Inclement Weather

FROM a transportation viewpoint the intersection of Woodward Avenue and State Street, Detroit, is one of the heaviest loading points on the busiest line of the Department of Street Railways' system. Located in the heart of the retail district and adjacent to the office building section of Detroit, approximately 14,000 people board the cars daily at this point, of which number about 6,000 are transported between the hours of 3 p.m. and 6 p.m. Motor car traffic on Woodward Avenue is also very dense, and the intersection is under control of traffic officers at all times, except late at night and during the early morning hours. A safety zone of the raised platform type has been in use at this intersection for some time to accommodate northbound car riders. Two city car lines pass this zone, the Woodward line and the Hamilton line, and in addition all northbound interurban cars.

The question of providing a shelter for passengers using this zone had received the attention of the Department of Street Railways during the previous year, but, on account of the experimental nature of the structure, decision to erect it was not reached until December, 1924. It is unique in the respect that it takes up no more of the street area than that required by the usual raised loading platform.

The length of the structure is 220 ft., divided into eleven bays of 20 ft. each. In three of these, symmetrical about the center line, are placed entrances facing the curb. At the division points between the bays are the twelve 9-in. double-channel columns, which, by means of cantilever beams, support the roof of the shelter and are held to concrete foundations with anchor bolts. There are no column supports on the track side.

The width outside to outside of the concrete platform is 7 ft. 1¼ in. Its front edge is 2 ft. 3 in. from the gage line of the rail and 5 ft. 10¼ in. from the front face of the columns. From the top of platform to the under side of the steel purline the distance is 8 ft. 6 in.

The upper portion of the openings in the rear wall of the shelter between columns is closed with standard non-ventilating steel sash, glazed with polished wire glass. Below the sash sheet steel panels are used to close openings between the concrete platform and the sills. It is not intended to remove any portion of the rear wall during the summer months.

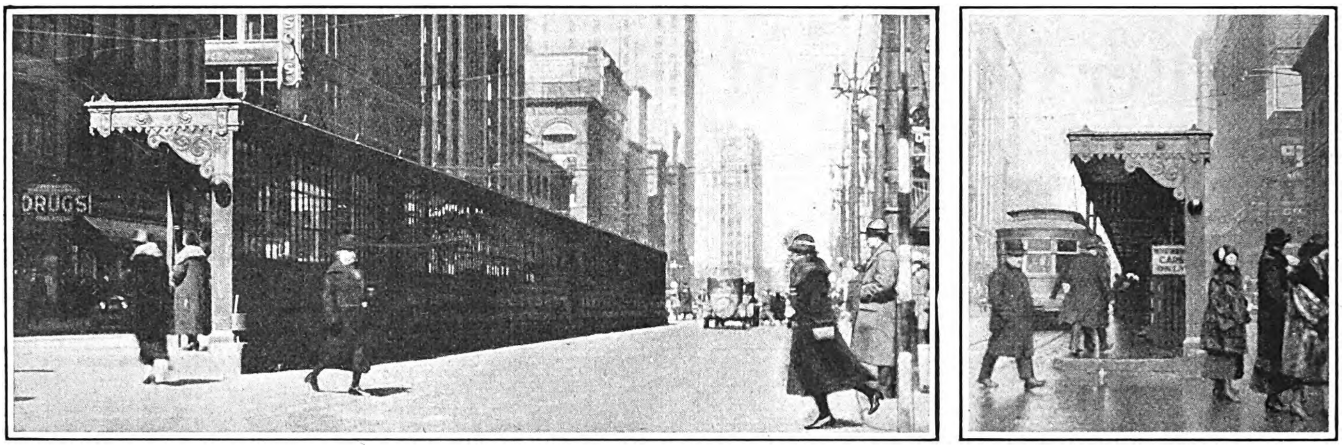
The roof is made of 2-in. dressed and matched lumber, covered with prepared roofing and metal flashed. At each column a metal sump is inserted and connected by means of wrought iron pipe on the inside of the column to a box in the concrete platform which discharges rain water on the surface of the street.

On account of the prominent location of the shelter, particular attention was given to its appearance. An ornamental treatment, consisting of applied castings and wrought iron moldings, was designed to relieve the stiff lines of the steel frame and to be in keeping with ornamental work of the adjacent store fronts.

Lighting is provided for the interior by means of standard ceiling fixtures with metal shades, and at the end, fronting traffic, a red warning light is attached to the column.

The job was authorized Dec. 27, 1924. The plans were prepared, foundations installed and contracts placed by the Department of Street Railways' forces. The structural steel frame was erected Jan. 15, 1925, and by Jan. 20 the roof, sash and glass were in place and the foundation work completed. The ornamental iron work required more time to prepare and install, but use of the structure was made by Jan. 20.

In making use of the shelter, the operating division introduced an innovation by adopting a berthing system in handling the cars of the two lines using Woodward



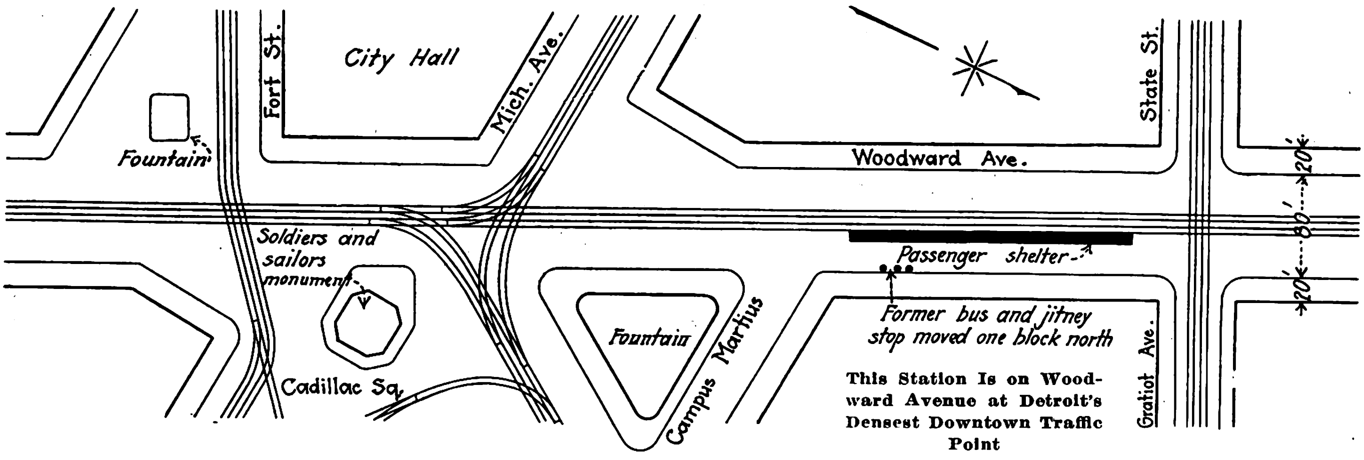
A Roof and One Side Have Been Erected Over an Island Platform

Avenue. To the Hamilton line, which accommodates the lesser number of passengers, the northern third of the structure is assigned. Interurban cars also stop here. The Woodward line uses the remaining two-thirds. Instructions were issued that all cars were to stop for passengers only at these designated points, rather than to attempt to come as near the corner as possible, as had been the case previously. Signs were erected to advise passengers where to expect the cars. This berthing system has worked out very advantageously in the movement of cars and will be adopted for similar situations in the central district.

The Hamilton line is equipped with Peter Witt cars, while the Woodward line has motor cars and trailers. To expedite traffic, the shelter was adapted as a prepayment station in so far as the Woodward line only is concerned. Standard fare boxes were placed at the entrances and a barrier, with similar entrance, was erected between the Woodward line zone and the Hamilton zone. As the front of the shelter is open, provision had to be made to prevent persons crossing the tracks into the prepayment zone. This was accomplished by a number of standard portable traffic signs, which were placed on the far side of the tracks and loosely connected with a manila rope. This prepayment is in use only during rush hours and has resulted in considerably more speed in loading.

A word might be said about general traffic conditions in the street in connection with the shelter. Formerly there was a motor bus and jitney stop in this block opposite the southern end of the structure. This has been moved one block to the north, thus freeing the curb of these parked vehicles. Automobile traffic now moves past the shelter more easily than it passed the former safety zone, and the Police Department advises that conditions have been improved by the changes.

There was some question about the ability of the car riders to reach the shelter as easily as they had reached the zone. It has been demonstrated that there is no additional trouble to use the shelter, and as the system of berthing cars mentioned above prevents confusion within the structure, the general effect is to expedite movement of traffic in every way.



This Station Is on Woodward Avenue at Detroit's Densest Downtown Traffic Point

Increasing Volume of Utility Financing

According to statistics recently compiled by the Institute for Research in Land Economics and Public Utilities, Madison, Wis., the total volume of new public utility security issues is constantly increasing. During 1924, as reported in the *Commercial & Financial Chronicle,* it exceeded a billion and a half dollars and constituted 40 per cent of all corporate financing. In this calculation, the financing of the steam railroads is not included among the public service issues.

The figures for the five years preceding 1924 are given in the accompanying table.

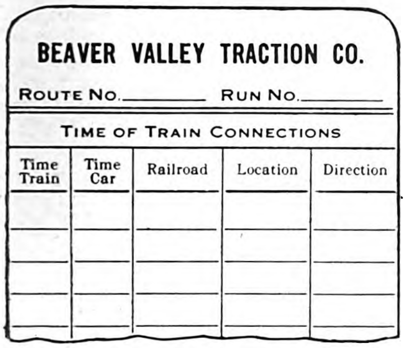
TOTAL NEW ISSUES OF PUBLIC UTILITIES*

Year	Amount	Per Cent of All Corporate Financing
1923	$1,138,396,158	35
1922	975,136,745	32
1921	671,085,220	28
1920	496,822,550	17
1919	462,271,650	17

* Exclusive of steam railroads.

Trolley That Meets All Trains

IN THE Beaver Valley of Pennsylvania a familiar fable has been brought to pass in real life. The passenger traffic of the Beaver Valley Traction Company consists to an appreciable extent of people coming from the railroad stations. If good connections are made between the street cars and the arriving railroad trains, the railway secures more riding than would be the case if these connections were not carefully made. For that reason a card has been prepared to aid the trainmen. This shows the times of trains and car trips. Operators are instructed to wait at the railroad station one minute when on schedule time, in order to make train connections. Regardless of schedule, however, cars will wait for a train if it is at the station or if the train is apparently about to arrive. Of course, it is not possible to so schedule the cars that every train is met, but the use of these cards has resulted in making more connections than would be the case otherwise.



BEAVER VALLEY TRACTION CO.

ROUTE NO.________ RUN NO.________

TIME OF TRAIN CONNECTIONS

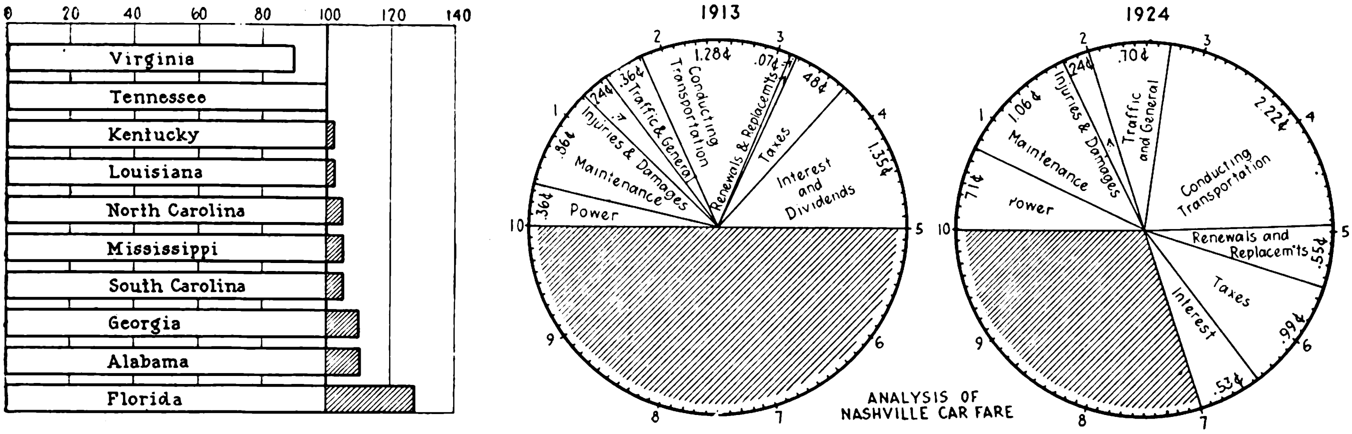
Time Train	Time Car	Railroad	Location	Direction

This Small Card Can Readily Be Referred To by the Car Operator to Make Connection with Train

Electric Railway Statistics in Southern States Compared

SOME statistics on electric railway fares in Tennessee and other Southern states have recently been compiled in graphical form by the engineering department of the Railroad and Public Utility Commission of Tennessee. Three of these graphs are presented in the accompanying charts. The first shows on a percentage basis the local car fares in ten Southern states, as of Jan. 1, 1925, the Tennessee average fare of 6.66 cents being taken as 100 per cent. The average fares for each state were obtained by weighting the fares in each case according to the population served.

The two charts to the right show an analysis of the expenditures made from the Nashville fare in 1913 and in 1924. The usual method of dividing a circle according to accounts is followed, but the entire area of the circle represents 10 cents in each case and the shaded portion that portion of 10 cents which is returned to the passenger when a dime is tendered for fare. The fare in 1913 was 5 cents and in 1924 was 7 cents. The only account which has remained the same is "injuries and damages" at 0.24 cent. The greatest increase that has occurred is in the item of taxes, which have more than doubled.



At Left—Weighted Average Electric Railway City Fare in Ten Southern States. At Right—Chart Showing Changes in the Divisions of the Fare in Nashville Between 1913 and 1924

Financing Rapid Transit Extensions in Hamburg

An Increase in the Rate of Fare Would Be Applied Partly to Defray Increased Operating Costs and Partly to the Construction of New Lines

By WILHELM STEIN
Managing Director Hamburg Elevated Railway,
Hamburg, Germany

THE elevated railway company of Hamburg, Germany, which operates the elevated and subway lines (78 track-miles), all the surface lines (250 track-miles), the Alster River boat lines and the autobuses, is an example of management with dual control. It is a stock company in which the state of Hamburg is interested through capital investment and through participation in the management.

In the year 1924 there were carried in all 316,000,000 passengers. Up to the present time fares have been very low, not above the level of 1913. A zone system is in effect, the rates being from 10 to 20 pfennigs, depending on the length of ride. Most of the passengers ride for the lowest fare, the average revenue per passenger being 11.3 pfennigs. The pay of the men has risen considerably, and along with the shortening of the working hours the cost per hour is now 85 per cent greater than it was in 1913. Moreover, materials cost more and taxes are nearly twelve times as high as before the war. So today the existing tariff does not produce sufficient revenue. Only by severe crowding of the cars, particularly during the hours of maximum travel, has it been possible to meet operating expenses.

The lack of housing facilities, together with compulsory methods of housing introduced since the war, have kept the population from changing their residences in accord with changes in places of employment. On this account there will be a loss of many riders if changed conditions permit a freer choice in places of residence. However, traffic is constantly increasing, while the company is unable to care for it with the necessary facilities. The street railways are also contending with increased street congestion. Relief can be obtained only through the construction of new subways. In this respect Hamburg does not differ from other large cities of the world.

OBTAINING CAPITAL FROM FARES

Raising money for the construction of new subways through the issue of capital stocks or bonds is rendered the more difficult in that for the new lines the meeting of interest payments from operations cannot be guaranteed under present conditions. Neither is the state in a position to raise the necessary capital. The company has therefore proposed to obtain the necessary money out of operations through a continuing increase in fares. For this purpose the rate of fare will have to be raised about 5 pfennigs. Of this increase the company would retain 2 pfennigs to cover increased operating costs, while 3 pfennigs would be placed to the credit of the state. The state would pledge itself to return this amount to the company for the purchase of new capital stock at the rate of 200 per cent. The money so collected would be applied to the construction of new rapid transit lines, but the capital of the undertaking would be charged with only half the dividends otherwise due. The contribution of 3 pfennigs can later be diminished, or the fare can later be increased, if the rate proposed now does not suffice. The whole suggested agreement is revocable, so that the proposed method of financing can be replaced later by customary methods.

The state of Hamburg has not yet given its formal consent to this proposition, which has been put forward as necessary in order to get public opinion accustomed to the modern idea that the riders themselves must contribute to the extension of the train service, and that on account of the lack of fluid capital, which is an aftermath of the war, new capital can best be obtained from savings. It is confidently expected that the state will in a short time accept the proposition of the company, so that new railway construction may be started.

In other respects the proposed plan for raising money corresponds basically to the methods followed in various countries by means of which new streets have been obtained for automobile traffic. In these, by means of taxation and assessments on the users of the vehicles, funds for road construction have been built up. There is no reason why this same method cannot be used for railway construction. It is especially adapted to those cities where a single rate of fare can be collected by the use of automatic ticket machines, as in subways.

Blue Envelopes for Commendation

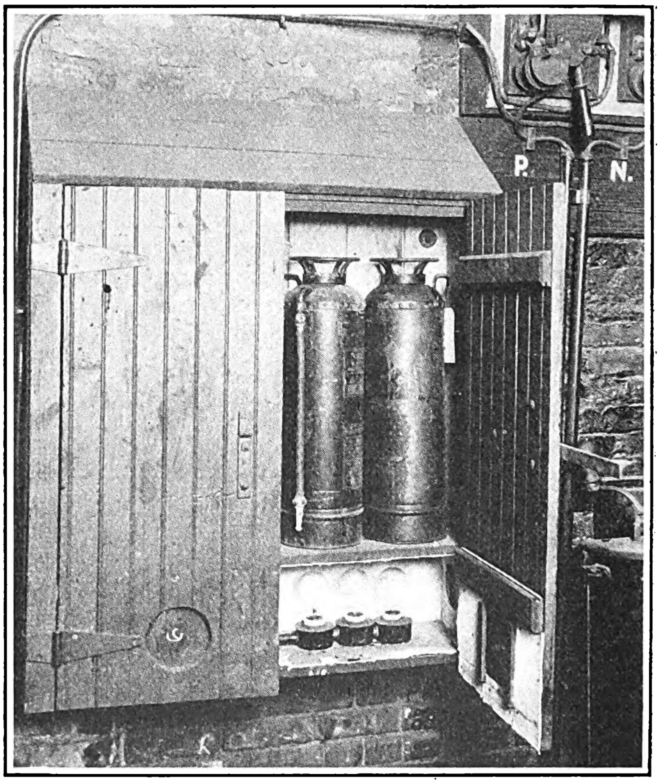
MOST railways have found the public more ready to send in criticisms of the service and of acts of the trainmen than to transmit commendations of either, when some especially meritorious acts come before their attention. To encourage the latter kind of communication, the Department of Street Railways, Detroit, has been carrying posters in its cars asking passengers to advise the management regarding especially meritorious service by the employees, as well as objectionable practices. Such information, it says, will help to improve the service. The department also issued a bulletin to its employees on the subject on the first of April this year. This bulletin reads in part as follows:

> A BLUE ENVELOPE MEANS A COMMENDATION FOR YOU
>
> Our patrons are continually calling our attention to the thorough manner in which a motorman or conductor performs his duties, such as waiting for them to get to and board the car before proceeding, clearly announcing all streets, etc., or performing a special act of courtesy, particularly in the case of a cripple, or someone who is handicapped in some manner. The two pages of commendations in the March "Co-operator" show the extent to which these things are appreciated.
>
> Hereafter when a letter of comemndation is being forwarded to the division superintendent to be noted by an employee, a notice to that effect will be sent from this office in a blue envelope addressed to the employee involved.

Housing for Fire Extinguishers

FIRE EXTINGUISHERS have been given effective protection against freezing in the 155th Street shop of the Eighth Avenue Railroad, New York, by providing a housing which is heated by lamps. The housing is approximately 3 ft. square by 18 in. deep and provides space for holding four fire extinguishers. A shelf is provided about 8 in. above the bottom. The fire extinguishers stand on this, the space below the shelf being utilized as a compartment for five lamps. This compartment is lined with Transite.

The location of fire extinguishers is indicated in the Eighth Avenue shop by providing red glasses, through which the rays from the lamps inside the housing shine. Each door of the cabinet has a 4-in. diameter hole, with a red glass inside. Two 3-in. holes with similar red glasses are provided in the end. The heat from the lamps is sufficient to keep the extinguisher from freezing during the most severe weather.



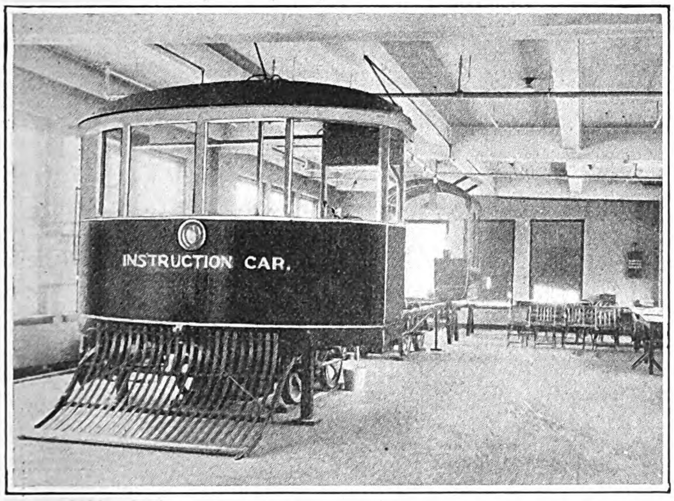
Housing for Fire Extinguishers with Lamp Circuit Provided to Keep Extinguishers from Freezing

Examining and Teaching Platform Men

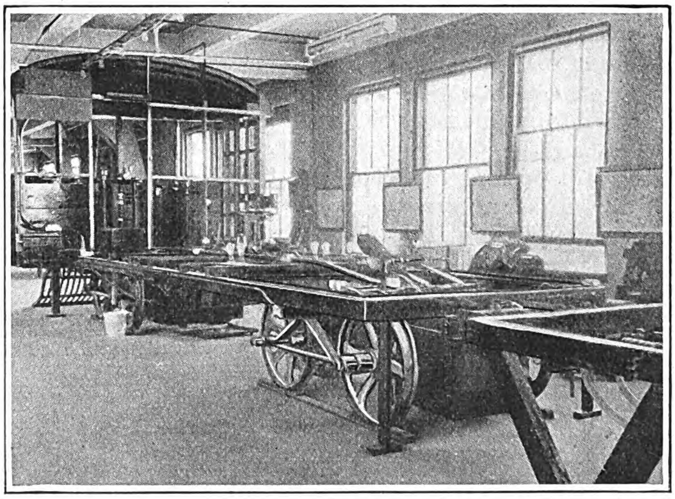
Applicants for Positions as Trainmen on the Denver Tramway Are Given Complete Course of Instruction and Are Kept on Probation for 90 Days—Brass Plate Indicates Each Man's Name to Passengers—All Trainmen Called for Additional Instruction Twice Each Year

REALIZING the importance of maintaining cordial relations between the traveling public and its platform employees, the Denver Tramway not only selects and trains its new men with extreme care but also follows up the original instruction by calling each platform employee to the instruction department semi-annually for a review of the rules and practices. New operating problems are also discussed at that time.

The work of selection and training of new men is handled by an instruction department under the direct supervision of the superintendent of transportation. When a man applies for work on the cars he is given an application blank to fill out in his own handwriting, and, with this as a guide, is interviewed by the superintendent of employment to determine his fitness for the job. The application is then indexed and filed by class until such time as new men are required.



This General View of the Denver Instruction Room Shows the Facilities that Are Available for Training Students



The Instruction Car Is Equipped with Various Types of Apparatus Used on the Property

When openings occur, applicants are selected from the eligible list and the men are called for interview. As each man reports, the job is explained to him in detail by the chief instructor and he is given to understand exactly the nature of the work expected and the cost of entering the service. If the conditions of employment are satisfactory to the man, he is then sent to the assistant superintendent of transportation with his application form and a note from the chief instructor. Here he is again interviewed. If found satisfactory, he is sent back to the chief instructor and the process of actual employment starts. At this time a form, shown in an accompanying illustration, is started, and subsequently becomes a complete record.

The applicant is next sent to the doctor and to the photographer, for a physical examination and photograph. If passed by the doctor, he is sent to the company tailor to place his order for a uniform. In addition, conductors are required to supply themselves with a trip sheet book and a change carrier. Before proceeding further with the instruction of the applicant a $5 good faith deposit is required from him, with the understanding that this will be forfeited if he fails to qualify or declines to take the position after the training is completed. This deposit is returned later when the applicant has progressed to a certain stage in his preliminary work. Conductors are also required to pay the premium on a surety bond.

At this time also the candidate makes application for membership in the Hospital Association, which entitles him to free medical service when sick. For maintenance of this hospital fund 5 cents per month is deducted from each man's pay. Any deficiency in the fund in excess of the amount so collected from employees is made up out of the treasury of the company.

Candidates for positions also make application at this time for disability benefits under a group insurance plan which has been worked out by the employees' representative committee. A blanket policy is carried, which gives each man the benefit of the reduced rate resulting from the group plan. Premiums in accordance with the amount of insurance applied for are paid by the individual, and each trainman is limited to a total insurance amounting to $25 per week disability benefit, or $2,500 in the event of accidental death.

After these preliminaries are completed the applicant is supplied with the company book of rules, street directory, street guide, badge and preliminary examination questions. An order is then made out authorizing the beginning of road instruction, and the man is directed to the superintendent of the division where he ultimately will be assigned. The period of this road instruction varies with the aptitude of the applicant, but is not less than 90 hours for standard trainmen and 72 hours for trailer conductors.

Road instructors are selected from the older employees who have high efficiency standings, and these men are given special training in handling new applicants on the cars. They are brought into the instruction department at intervals of 90 days and the procedure for breaking in students is gone over with each one of them carefully. During actual work as instructors they are paid 50 cents a shift extra, but the amount paid for the training of any one student is limited to $5. At any time within 90 days after the breaking-in period a student has the right to go back and ride with his teacher for additional instruction. The student is paid $1 per shift while breaking in, but this compensation is limited to a total of $10 regardless of how long he is held by the instructor before release. The record of instruction, together with final approval of the student, is made out on the form shown in an accompanying illustration, and the applicant is again returned to the instructor. At this time the accident blank is carefully explained to him.

WRITTEN EXAMINATIONS REQUIRED

In the meantime, the student, who was previously supplied with a set of preliminary questions and their answers arranged in catechism form, is expected to have studied them carefully and is now called upon to write his preliminary examination. He also makes out a fictitious accident report, to make sure that he thoroughly understands how to handle the form. After this, he makes a trial trip in charge of a conductor or motorman road inspector. He is allowed to operate the car to demonstrate that he is thoroughly qualified for the work to which he is to be assigned. If he fails to pass during this trial trip he is returned to his original platform instructor for additional training. If he fails to make a passing grade (90 per cent) on his written preliminary examination he is required to give the questions additional study and must then come back to write the examination over again.

After the student has satisfactorily passed both tests his good faith deposit is returned to him and he is sent to the office of the superintendent of transportation to be placed on record as entering the service. In this record the new man is retained on a probation list for 90 days, at the end of which time the division superintendent in charge of the division to which he is assigned determines whether he is to go on the regular extra list for that division or is to be dropped from the service for incompetency. At this time the student is supplied with the final examination questions and answers and is allowed 25 days in which to report to the instruction department to write this examination.

During the probationary period of 90 days the new man is closely followed up. A road instructor rides with him at least once a week, watching his operation and giving him verbal instructions or pointing out mistakes or errors in his method of operating the car or handling his passengers.

Each new man is supplied with a nameplate before reporting for duty. This is a small brass plate with black letters about $\frac{3}{8}$ in. high and is issued to both motormen and conductors. A frame on the fare box is provided, into which each man slips his plate when he takes his place on the car. In this way the names of both conductor and motorman in charge of the car are always in view of passengers. It is felt that this practice tends to identify the trainmen personally and to put them on a little more friendly footing with the passengers who ride a given line regularly.

In the meantime, the man's photograph has been received and references have been written to former employers and others indicated on his application blank.

Date Employed .... 192..

Name..............................Mot..........Age ....
Address ....Con..........O.K.'d by......
Tel. ....Tr. C.........School ....
Photographed ....Physically examined ....
Cap ....Uniform...... Changer.......
Bond ....Deposit... Breaking-in order....

SUPPLIES { Cap Badge......... Cap Band.........St. Guide.........
Red Rule Bk....... L. L. R. Bk........ Exam. Ques.......

INSTRUCTORS { On Standard Car............Days.......Pay.......
On Safety Car...............Days.......Pay.......

Examination ....Trial Trip...........Date Comp............
Watch ....Tools ....House ....
Remarks ....

A Full Record of the Student's Road Instruction Is Compiled by Trainman Teacher

THE DENVER TRAMWAY COMPANY

BREAKING-IN ORDER—RETURNABLE IN .... DAYS.

..........................Tr. Con. Mot. ....192.. Date .... Division

.... Supt. Transpt.
.... Division Supt.
.... Instructor

.... Standard Car Instructor
.... Safety Car Instructor

Inst. not less than ..... hours.
Inst. not less than ..... hours.

Date														
Hrs.														

Route No.	No. Hours	Instr. Badge	Route No.	No. Hours	Instr. Badge	Route No.	No. Hours	Instr. Badge
2	.....	.....	13	.....	.....	50	.....	.....
3	.....	.....	14	.....	.....	58	.....	.....
4	.....	.....	15	.....	.....	61	.....	.....
5	.....	.....	20	.....	.....	64	.....	.....
6	.....	.....	23	.....	.....	66	.....	.....
7	.....	.....	28	.....	.....	72	.....	.....
8	.....	.....	29	.....	.....	74	.....	.....
9	.....	.....	37	.....	.....	75	.....	.....
10	.....	.....	38	.....	.....	82	.....	.....
11	.....	.....	39	.....	.....	83	.....	.....
12	.....	.....	40	.....	.....	84	.....	.....

Trainman Instructor: Instruct student on such of following things as may apply to his future work, placing your badge number after each item when student understands it.

MOTORMAN	CONDUCTOR
Picking up trailer..........——	Picking up trailer..........——
Dropping trailer ....——	Dropping trailer ....——
Taking car out of house.....——	Taking car out of house.....——
Putting car in house........——	Putting car in house........——
Location relief points........——	Location relief points........——
Picking up trolley ....——	Picking up trolley ....——
Learn rules 111 to 149.....——	Learn rules 79 to 110......——
Emergency application ......——	Pull emergency cord........——
Motor regeneration stop......——	Division transfer points......——
Fill in all reports used......——	Fill in all reports used......——
Location of all switches and fuses ....——	Major-minor trip sheets on alternating lines ....——

To insure prompt payment of trainman teacher it is important that above spaces be filled in completely. (Make any necessary remarks on other side of this order.)

I have fully instructed student on above routes and duties opposite which I have placed my badge number.

.... Standard Car Instructor
.... Safety Car Instructor

Progress Made by New Employees Is Recorded on This Form

If for any reason the man's previous record seems to be unsatisfactory he is dropped at any stage of the instruction period. Assuming that his history and references are satisfactory, however, he is now a regular member of the extra list in the division to which he has been assigned. A full record has been kept of his progress. All reports by instructors and inspectors are kept in the personal record file of the man, which is maintained in the transportation department. From this point on, as his period of service increases, and as various reports come in regarding his performance from time to time, this personal record is maintained and soon becomes a complete source of information regarding his efficiency and past record at any time that such information may be required by the transportation department.

Called for Instruction Every Six Months

At this stage the man's instruction is far from complete. Although he is expected to be fully trained in operating his car and to be entirely familiar with the rules and practices of the company, it is believed that these men as well as older employees must be carefully followed up and supervised if the service is to be maintained at maximum efficiency. All new men entering the service during a six months period are classed together and are called in to the instruction department for such additional instruction as may be decided upon from time to time. A list of more advanced questions regarding details of the service and proper treatment of passengers, action to be taken in emergencies and methods of reducing accidents in service is taken up and discussed at this time. These subjects are all presented in the form of questions and the man is then required to write another examination covering the subjects taken up. Any new operating questions which have come up during the six-month period are also discussed with these new men, so that they may be entirely familiar with changes or developments in the company's practice.

Old employees are likewise given additional instruction and required to take part in discussions of general operating problems at intervals of six months. With old employees this is made a semi-annual campaign extending over a period of approximately two weeks, during which all trainmen are called in to the instruction department at staggered hours to take part in this work. Safety, courtesy, relations with the public and proper handling of equipment are the main subjects touched on during these instruction meetings. For the purpose of making sure that all men are entirely familiar with the car equipment, a skeleton car, shown in an accompanying illustration, has been erected in the instruction room. All of the more important items of equipment are arranged on this car so that they are readily demonstrated. This instruction car contains several types of controllers, fully connected up with lights to indicate the operation of the motors, and is equipped with air brakes and interlocking door control.

These semi-annual instruction periods give an excellent opportunity for familiarizing all trainmen with any new items of equipment which have been adopted for cars during the period. Each man is required to pass an examination on the subject covered and is held out of service until this examination is satisfactorily passed. As in the case of the preliminary and final examinations for students, a passing grade of 90 per cent is required.

Traffic in New York City Terminals

THE traffic in and out of the Hudson Terminal of the Hudson & Manhattan Railroad was the largest of any of the suburban terminals in New York during 1924. This terminal is fed by a two-track line, but has a number of loading and unloading platforms. The traffic in and out of the Flatbush terminal of the Long Island Railroad was the largest of any of the trunk line terminals. This also is served by a two-track line. Figures for all of the railroad terminals follow:

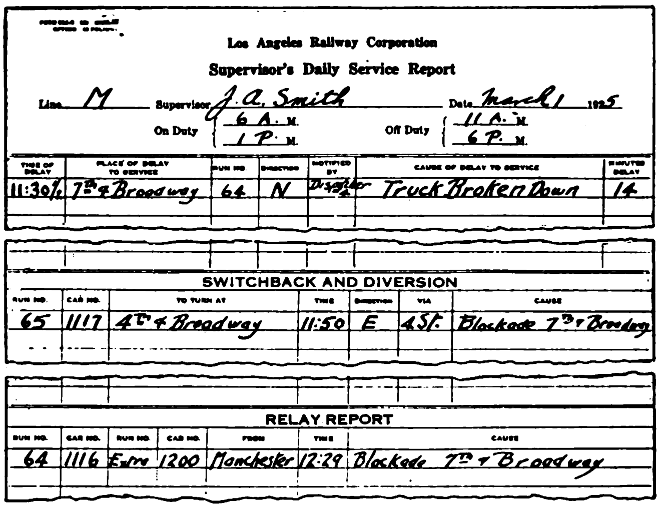
TRAFFIC IN PASSENGERS DURING 1924 AT RAILROAD TERMINALS IN NEW YORK CITY

Pennsylvania Station:	
Pennsylvania Railroad	10,171,157
Long Island Railroad	32,898,590
Baltimore & Ohio Railroad	550,000
Lehigh Valley Railroad	495,263
New York, New Haven & Hartford Railroad	505,301
Total Pennsylvania Station	44,620,311
Grand Central:	
New York Central Railroad	22,439,299
New York, New Haven & Hartford Railroad	17,738,914
Total Grand Central	40,178,213
Hudson & Manhattan:	
Cortlandt Street	66,192,941
Uptown stations	37,496,357
Long Island Railroad:	
Flatbush Avenue station	40,915,057
Long Island City	1,187,240
Woodside	2,575,000
Jamaica (including Union Hall Street station)	3,210,000
East New York	1,500,000
Staten Island Rapid Transit Railway:	
St. George Terminal	11,828,314

Of the railroads delivering passengers in New York by direct entrance or by ferry or Hudson & Manhattan tube the Long Island Railroad led with 75,000,887 in and out. The Pennsylvania came next with 40,456,529. The four following were: Erie, 32,043,150; New York Central, 31,717,518; Lackawanna, 22,359,818; New Haven, 18,339,242.

Combined Service Report Used in Los Angeles

A NEW standard form for reporting delays to service, switchbacks, diversions and relays has been adopted by the Los Angeles Railway. This is intended to give, in segregated form, all essential information regarding a day's operation. The reports are prepared by the line supervisors, and combining these data on one form eliminates necessity of sorting a number of miscellaneous reports, as was necessary heretofore.



Los Angeles Railway Corporation

Supervisor's Daily Service Report

Line M Supervisor J. A. Smith Date March 1 1925

On Duty 6 A. M. / 1 P. M. Off Duty 11 A. M. / 6 P. M.

Time of Delay	Place of Delay to Service	Run No.	Direction	Notified by	Cause of Delay to Service	Minutes Delay
11:30½	7th & Broadway	64	N	Dispatcher	Truck Broken Down	14

SWITCHBACK AND DIVERSION

Run No.	Car No.	To Turn At	Time	Direction	Via	Cause
65	1117	4th & Broadway	11:50	E	4 St.	Blockade 7th & Broadway

RELAY REPORT

Run No.	Car No.	Run No.	Car No.	From	Time	Cause
64	1116	Extra	1200	Manchester	12:29	Blockade 7th & Broadway

Use of This Form Makes it Unnecessary to Sort Out Several

Association News & Discussions

Wisconsin Association Holds Annual Meeting

The Program Covered General Utility Subjects, Including Public Relations, Regulation and Financing—An Effort to Dig Into the Fundamentals Characterized the Discussion

DISCUSSION of some specific phases of public relations, regulation, education and financing occupied the attention of 300 members of the Wisconsin Utilities Association during a well-filled one-day session comprising its annual meeting, which was held at the Hotel Pfister in Milwaukee on April 16. Even with so full a business program, time was found during the annual dinner held in the evening for an illuminating address on "Our Federal Constitution" by H. F. Atwood, president Constitution Anniversary Association, Chicago. A delightful entertainment program was arranged by Chairman B. W. Arnold and general dancing followed the dinner.

Although the meeting was devoted almost entirely to a discussion of more or less general subjects of interest to utility men, the program was characterized by a marked effort to avoid indulgence in generalities, and there was a tendency "to get down to cases" in the consideration of each subject.

In his annual address President G. C. Neff explained that the association program during the year had been formulated with a view to covering technical subjects at the individual section meetings, of which there were five during the year. By this plan, he said, it was possible to devote the annual convention meeting to a discussion of the broader problems of interest to the entire industry.

NEW ASSOCIATION SERVICES

A number of steps taken during the year to increase the value of the association to its membership were outlined by Mr. Neff. These included the starting of a monthly association bulletin and arrangements for the support of additional fellowships at the state university to stimulate utility research work. This now includes a railway fellowship, which is producing a research on track and paving design. Letters and bulletins have been used to advise members of pending bills in the Legislature on public utility matters. Mr. Neff pointed out the importance of individual company officials keeping in touch with their respective legislators to keep them supplied with authentic information relative to proposed measures introduced in the Legislature. He maintained that there are many reasons for looking with optimism on the results accomplished by the utility industry. He said that utilities are leading all other industries in bridging the gap between capital and labor through the sale of securities to employees. Other industries are now following this example. Sale of securities to the general public, through employee salesmen, has resulted in the distribution of these securities to approximately 180,000 investors in Wisconsin. Extension of electric power to rural districts, Mr. Neff said, promises to revolutionize farm life. As an example of improved public relations and better mutual understanding, he pointed out that not a single utility in Wisconsin has taken a case into the courts for a higher rate during the year.

LEGAL PHASES OF REGULATION

L. E. Gettle, chairman Railroad Commission of Wisconsin, presented a paper on "Some Legal Phases of Regulation in Wisconsin." Under this subject he discussed a number of cases recently decided by the Supreme Court of the state, which raise important questions regarding the power and jurisdiction of the commission in the regulation of public utilities. Among several cases discussed by Mr. Gettle was included "State vs. Washburn Water Works Company," 182 Wisconsin 287. The decision in this case raises a question of the power of the commission to order extensions of service of utilities within cities, without the prior action of the municipal authorities.

Another question raised by a recent decision relative to an order of the commission regarding track extensions in the city of Madison involves the right of the commission to place conditions and reservations in its orders. In this case, a decision on the application of various individuals and associations in the city of Madison for an order directing the Madison Railway to extend its service on Monroe Street included an order of extension conditional on the city relieving the company of the necessity of paving. The commission, in considering the case, was of the opinion that unless the street railway was relieved of the burden of paving, except such paving as was necessary because of the presence of the tracks in the street, the extension could not be ordered. The court decided against the right of the commission to issue a conditional order of this kind and took the position that such an order must be based entirely upon the facts presented.

In discussing this decision, Mr. Gettle argued that it is not good business nor good law for the commission to be prohibited from looking to the future, and building with reference to conditions which are reasonably likely to occur, when shaping its orders. In the case under discussion, he said that the commission found that the cost would not be excessive to the street railway company if it were relieved of the paving burden. In other words, in order to obtain the extension the city, which was in fact one of the applicants for the extension, was required in some form or other to contribute to its cost an amount which would equal the cost of the paving of which the company was relieved.

UTILITIES ARE NATURAL MONOPOLIES

Mr. Gettle said that in general practice this cost would have been met by special assessments levied against the owners of the property abutting on the street. In any event, he held that the principle was not in any sense different from that which is constantly being recognized by the courts and commission that extensions of service under certain conditions must to some extent be financed by contributions from consumers for whose benefit the service is extended. He explained that the commission, in general, has fostered the adoption of definite extension rules by various utility companies to the end that discrimination in such extensions might be eliminated, but added that where such rules were not in effect, and extensions were desired, the commission has uniformly designated the rules under which the extension should be made. Frequently this involves an investment on the part of the petitioner in the form of a contribution.

T. D. Crocker, Northern States Power Company, Minneapolis, likewise reduced his discussion of public relations to an analysis of specific elements of the subject. He showed that the utility business is fundamentally monopolistic in character and that this very condition is in itself a potential cause of suspicion and irritation. Although the average American citizen is allowed a choice of the location of his home, the contractor who erects it, the workmen who are employed, the stores in which he trades, and most of the other facilities which he requires, there is no option but to obtain utility service—gas, electric and transportation—from the utility company which enjoys a monopoly in that section. Consequently, he held that the maintenance of favorable public relations is dependent upon a clear understanding of this condition and an appreciation by the management of the extreme importance of overcoming the natural tendency toward irritation at this restriction. For this reason, Mr. Crocker maintained that the contacts which the consumer makes with the utility organization are of even more importance from the standpoint of building good or bad public relations than in the case of a competitive business. Success in building friends in the community, he said, depends almost entirely on the effect of the contacts which the individual consumers make with employees of the company. A friendly public feeling can be built up only when the employees are enthusiastic about the utility company by which they are employed. When they have confidence in the management and feel that the company has an interest in each man's welfare, each employee is watching for every opportunity to help the company and will go out of his way to do something that will make a friend.

Here—in the employees who directly come in contact with the utilities' customers — lies the mainspring from which public good will grows. Mr. Crocker said that the public knows a company, not by the spectacular things it does, but by these daily, personal contacts that either please or irritate. A tactless, disgruntled clerk, trainman or troubleman can arouse more resentment than the general manager can counteract. Mr. Crocker expressed a conviction that the American public in general is fair, and that it will meet fair tactics in the same spirit in which they are offered. The illusive "public" which is being considered so much by the utility men these days, he said, is simply made up of a collection of the individuals who come into contact with the utilities' service. The public attitude toward the company is the net result of the impressions left with these individuals from day to day. He emphasized the importance of eliminating incipient cases of dissatisfaction and urged that every effort be expended to cultivate personal contact with consumers and to encourage criticism where this divulges any apparently insignificant sources of antagonism that may result in ultimate dissatisfaction. He concluded by advocating constant alertness on the subject of building a humanized or personalized conception of the company.

UNIVERSITY UTILITY COURSES

R. E. Heilman, dean of the School of Commerce, Northwestern University, outlined the widespread progress being made by the universities of the country in conducting public utilities business courses. He also said that this has resulted in the beginning of utility research work in some of the important universities of the country. Such work in progress at the present time includes the following:

Harvard University—a series of case books on utility management, being prepared by actual investigation of management methods in use at the present time; University of Illinois—an elaborate investigation of the result of municipal ownership and operation of utility enterprises in Illinois; Northwestern University—research work on public utility accounting and financing; Wisconsin University—the research being carried on by the Institute of Public Utilities and Land Economics.

Recent developments in public utility financing were discussed by G. E. Frazer of Chicago. He showed that the sale of preferred stock by utility companies has been the means of building a saving habit on the part of many people who previously had never made a practice of regularly saving their surplus funds. He explained, however, that this activity is in general limited to the large holding companies and indicated that the smaller independent companies have not availed themselves of this opportunity of building confidence. Several tendencies in utility financing, resulting from the widespread distribution of the securities, were indicated by Mr. Frazer. One such tendency is the simplification of trust deeds due to the difficulty of calling in outstanding securities for the purpose of making revisions.

COMING MEETINGS
OF
Electric Railway and Allied Associations

***May 5-8*—Southwestern Public Service Association, Rice Hotel, Houston, Tex.**

***May 8*—Metropolitan Section, A.E.R.A., Engineering Societies Building, New York, 8 P. M.**

***May 12-13*—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.**

***May 25-28*—National Association of Purchasing Agents, Milwaukee, Wis.**

***May 26-27*—Regional Motor Transport Conference, Chicago, Ill.**

***June 2-4*—Central Electric Railway Association, French Lick Springs, Ind.**

***June 3-4*—Iowa Electric Railway Association, Waterloo, Iowa.**

***June 10-12*—Canadian Electric Railway Association, Montreal, Quebec.**

***June 26-27*—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

***July 22-25*—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

***Oct. 5-9*—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

Mr. Frazer pointed out that every person who buys a share of utility preferred stock is giving a vote of confidence to the management. He said that there is some feeling that utilities are going into a great many different pockets in their financing and that this imposes a heavy responsibility on those charged with managing the enterprises. Widespread distribution of securities in the hands of the public has resulted in increased attention being given to the control of finances. This is resulting in greater control of capital expenditure and has developed the use of continuous budgets and monthly or weekly meetings of finance committees instead of the single annual meeting, as was the practice when an inflexible annual budget was used for controlling expenditures. He said that there has been an almost revolutionary advance in the control of financing, which has resulted in bringing the board of directors into closer relation with the actual management of the company. This development has been in the direction of giving closer control and more accurate forecasts of cash requirements. He summarized the modern tendency by saying that the increasing sale of securities to large numbers of the consuming public has developed a realization of the need for impersonal control of the money derived from such securities. This continuous budget, he maintained, is a decided advance in this direction.

Various committee reports were presented during the meeting and the following officers were elected for the ensuing year: President, George H. Wilmarth; vice-president, W. C. Butterworth; treasurer, H. A. Smith.

Advisory Committee on Waste

THE first step in a campaign to give impetus to the united industrial effort against waste and for the quickening of trade is the formation of a committee of five first-line executives, to act as an advisory body to the American [illegible]ineering Standards Committee. This advisory committee will consist of J. A. Farrell, president United States Steel Corporation; G. B. Cortelyou, president Consolidated Gas Company, New York; J. W. Lieb, vice-president New York Edison Company; L. F. Loree, president Delaware & Hudson Company, and Gerard Swope, president General Electric Company.

The committee will emphasize what is regarded as the fundamental principle of standardization: that standardizing must facilitate and stimulate, and not hinder industry. It will assist in keeping executives in touch with the national movement in its development, in extending its influence and support among industrial groups, and in bringing about the fullest co-operation along right lines between industry and government in standardization work, and particularly in the solution of the problem of industrial waste, into which Secretary Hoover has thrown the resources of the Department of Commerce.

Southwestern Association Program

MANY papers of interest to electric railway men will be presented at the annual meeting of the Southwestern Public Service Association to be held at the Rice Hotel, Houston, Tex., on May 5-8. Registration will take place at 9 a.m., Tuesday, May 5. A luncheon for the executive committee will be given at 12:15, followed by a general session at 2 o'clock. The reception and ball will be held the same evening at 8 o'clock. General sessions and meetings of the various sections will be held the next three days, with excursions Thursday afternoon.

Among the papers presented at the general meeting on Wednesday will be one by Gen. Guy E. Tripp, chairman of the board, Westinghouse Electric & Manufacturing Company, on "The

Future of National Electric Service," and one by President J. N. Shannahan of the American Electric Railway Association on "Electric Railways—a Growing Necessity." Of the papers on Thursday, "More Mass Transportation" by W. E. Wood, manager Houston Electric Company, is of particular interest to railway men.

Following is the program of the railway section, which will be presided over by Mr. Wood, chairman:

RAILWAY SECTION

Wednesday, May 6, Beginning 2 p.m.

"Our Transportation Problems in Houston," by C. J. Kirk, Houston, Supervisor of Utilities, City of Houston.

"Use of Labor Saving Tools on Track Maintenance," by E. S. Myers, New Orleans, assistant to vice-president New Orleans Public Service, Inc.

"Electric Railway Associations—Relation of Regional to National."

"The Why, When, and What of Publicity," by H. B. Hearn, Shreveport, president Shreveport Railways.

Thursday, May 7, Beginning 9 a.m.

"The Use of Buses in City Service," by W. B. Tuttle, San Antonio, president San Antonio Public Service Company.

"Current Collecting Devices," by L. E. Delf, Fort Worth, electric engineer Northern Texas Traction Company, and George Tongue, Dallas, Dallas Railway.

"Construction and Operation of Rear Door Treadle Car in Dallas," by G. I. Plummer, Dallas superintendent of traffic, Dallas Railway.

Friday, May 8, Beginning 9 a.m.

"The Type of Street Car Which Will Be Specified in 1930," by V. W. Berry, Fort Worth, general superintendent Northern Texas Traction Company.

"The Classification of Accidents, and Its Effect on the Work of the Transportation and Claim Departments," by Alves Dixon, El Paso, superintendent of railways, El Paso Electric Railway.

Election of chairman.

Welded Rail Joints

A MEETING of the executive committee of the joint committee on welded rail joints was held at the Engineering Societies Building, New York City, on April 23. Present were E. M. T. Ryder, vice-chairman, who presided in the absence of Dr. Burgess, chairman; William Spraragen, secretary; R. C. Cram, C. F. Gailor, G. C. Hecker, J. C. Lincoln, H. M. Steward, A. P. Way, Jonathan Wolfe, H. L. Whittemore and W. W. Wysor.

The meeting was called primarily to discuss certain suggested modifications in the tentative program of future work of the committee as recently adopted at the Washington meeting of the main committee. The subjects of welding wire, number of specimens and various details were carefully studied and some modifications in plans and order of work were adopted, all tending to facilitate the work.

A number of appropriations were authorized covering purchase of materials for the arc weld joint tests, testing work at Lehigh University, secretarial expenses and office supplies.

The third progress report of the committee is in press and will be distributed to the membership shortly. The vice-chairman announced that the demonstration tests of the otheograph or "educated tie" will be made at the General Electric Company's test track at Erie, Pa., on May 6. It is expected that representatives of the Bureau of Standards and of the American Railway Engineering Association will be present. The purpose of this demonstration is to determine the value of the device for use in connection with the work of the committee on welded rail joints and of the committee on stresses in track of the American Railway Engineering Association, the American Society of Civil Engineers also being interested in the latter committee's work.

Town and Country Planning Conference

A CITY and regional planning conference, under the auspices of the International Federation for Town and Country Planning and Garden Cities and the National Conference on City Planning, was held this week at the Hotel Pennsylvania, New York. Frederick P. Kettel, president Carnegie Corporation, was chairman of the general committee, and papers and addresses were presented by European as well as by American delegates. The topics discussed included the traffic problem, typical city plans, planning unbuilt areas, better distribution of people and industries, the New York regional plan, and zoning in practice.

On Thursday there were several round-table luncheons, of which one, conducted by J. Rowland Bibbins, was on transportation. At this meeting, which was attended by about 50 delegates, the following resolution was adopted:

> It is the sense of this traffic and transportation round table of the International City Planning Conference that the problem of traffic congestion and the development of adequate transport has become so involved that the approach to the solution thereto must now be broadened to comprehend all the passenger and freight agencies contributing to or affected by transport and traffic, the automobile, the bus, street railway and rapid transit, motor trucks, commercial delivery, railroad terminals and port traffic, industry, the pedestrian, and
>
> That a traffic policy should be developed for early adoption (to be modified as time may require),
>
> That such development should proceed in careful recognition of the many related factors involved,
>
> That any traffic policy and plan should be an organic part of a comprehensive city plan,
>
> That such policy and plan should encourage higher efficiency and organization in traffic and transport,
>
> That the plan should include a program and budget for its consummation.

The only paper directly on the subject of transportation presented at the conference was one in the group descriptive of the New York regional plan. It was presented by Col. W. J. Wilgus and related to recommendations for trunk line connections, passenger rapid transit, internal freight distribution and the port development in the city of New York. On the subject of passenger rapid transit, Colonel Wilgus declared that decentralization was the most important requirement to be borne in mind for a population of 20,000,000, the calculated size of the metropolitan district in 1970. This, he thought, could be accomplished largely by proper rapid transit expansion. Public ownership and non-political operation of these lines were recommended. To encourage the development of the metropolitan district as a whole, several through east and west lines from Long Island across Manhattan to New Jersey were recommended.

In the official discussion on this paper Daniel L. Turner, consulting engineer New York Transit Commission, agreed with Colonel Wilgus that decentralization of the population should be fostered in large cities. This was often unpopular from a transportation standpoint, because exising populations demanded more transit facilities rather than the construction of those facilities in unbuilt areas. One solution of this difficulty was local assessments for new transit facilities. Commenting on recent increases in street traffic, Mr. Turner declared it desirable to provide for main traffic arteries outside and inside the present built-up area. Such superhighways might be combined with parkways, as recommended by him for extensions in Queens County some time ago (See ELECTRIC RAILWAY JOURNAL for Nov. 24, page 892).

In conclusion Mr. Turner referred to the great increase in city debts, which during the last 25 years in New York had increased at a greater rate than the square of the population. A solution of how to obtain improved transportation facilities in circumstances of this kind was by benefit assessments. On this point he said, in part:

"In my opinion a pay-as-you-go policy based on benefit assessments is the most equitable and effective way of enlarging the financial resources of the community in the future. Every public improvement not only benefits the community at large, but also it produces a corresponding local benefit that accrues to the land in the vicinity of the improvement. And where there is a local benefit there should also be a local assessment. We have become so accustomed to the local beneficiaries of public improvements being permitted to retain all of the benefits for themselves that we accept such a principle as a matter of course without realizing how unfair it is to the entire community. Benefit assessment can and should be made to furnish its proper share of the money so urgently needed for future community requirements. This is the only equitable and effective way that the financial resources of our communities can be enlarged sufficiently to meet future demands. It means spreading the cost of all community activities among all those who benefit in proportion to the benefit each receives. The user of the city plant and the general taxpayer should not be the only ones to pay. The land-owner frequently benefits most of all and he should pay his share of the cost also.

"There is nothing new in the principle of benefit assessments. The communities already pay for their street openings by assessment. They pay for their sewers in the same way. In Kansas City the property benefited is assessed to pay for the parks. Under the conservancy law of Ohio the benefit assessment plan is applied to furnish the money to build flood protection works to save the cities, towns and countryside from damage and destruction. In Colorado the Moffat Tunnel through the Continental Divide is being paid for by benefit assessments, and in Detroit the public voted nearly three to one to pay for its rapid transit lines under a benefit assessment financial plan."

Engineering Council to Unify Reforestation Effort

TO FRAME plans for the elimination of waste in the administration of the vast public works functions of the United States government, and to unify national reforestation effort, the administrative board of the American Engineering Council will meet in Philadelphia on May 8 and 9. Engineers representing more than 30 local and national societies in all parts of the country will attend.

The council, of which ex-Governor James Hartness of Vermont is president, has sent to its member organizations throughout the country a request to aid in the observation of American Forest Week, which President Coolidge has proclaimed for April 27-May 3. Engineers in every state are expected to co-operate. F. K. Copeland of Chicago has been appointed chairman of the Council's Committee on Elimination of Waste in Industry. Other members are: Secretary Herbert Hoover, U. S. Department of Commerce; Dean Perley F. Walker, University of Kansas; R. E. Flanders, Springfield, Vermont; C. C. Thomas, Los Angeles; W. P. Hunt, Moline, Ill.

American Association News

T. & T. Executive Committee

REVIEW of the progress of the various standing committees and a discussion of plans for the program at the coming convention were the principal business coming before a meeting of the executive committee of the Transportation & Traffic Association at association headquarters, New York, on April 15. Abstracts of the reports of sub-committees will be asked for from the chairmen, but these will not necessarily be included in the printed report.

Reports from the sponsors of the standing committees indicated that substantial progress has been made and that the subject assignments will be covered in a comprehensive manner in the committee reports. In connection with the report of the joint accident prevention committee, President H. D. Briggs of the Claims Association was invited to take part in the discussion. It was agreed that one afternoon session at the convention should be devoted to a joint session of the Transportation & Traffic Association and the Claims Association. At this session the report of the joint accident prevention committee will be presented and discussed, in addition to other papers on accident prevention and general safety work.

Plans were prepared for formal discussion of the various committee reports, and it was agreed that the committee sponsors should be responsible for submitting lists of operating men to prepare these discussions. The sponsors are to submit their recommendations to the executive committee at the earliest possible date. No definite time schedule will be followed at the convention meetings.

The question of organizing a freight committee was discussed and it was decided that it would be advisable to defer this until next year. In view of the importance of this subject, especially to interurban railways, it was decided to have a paper presented at the convention and to arrange to have a formal discussion by various operating freight men.

President Cherry appointed as a committee on subjects to recommend definite subjects for study next year J. V. Sullivan, chairman; Samuel Riddle and G. H. Clifford. Those present were President T. C. Cherry, Samuel Riddle, W. H. Boyce, J. V. Sullivan, Paul E. Wilson and James W. Welsh, and A. H. Ferrandou, chairman of the committee on bus operation.

Wood Preservation

DATA on wood preservatives and preservation methods was presented the first day of a two-day meeting of the committee on wood preservation held at association headquarters, New York, on April 7 and 8. Various preservatives and methods of treatment were thoroughly discussed by manufacturer guests, with the view of presenting as much information as possible in the committee report for the information of the electric railway industry.

On the second day only committee members were present at the meeting, which was devoted to the reports of sub-committees on open tank treatment of poles, brush and service treatment of poles, pressure treatment of poles, and methods of increasing life of timber by other than preservatives. All submitted progress reports indicating that the committee will have available for presentation at the convention a valuable report covering the latest developments in the art.

Members present were R. C. Cram, M. J. Curtin, E. F. Hartman, W. H. Harwood, E. L. Morier and A. P. Way, chairman. The guests were J. G. Kreer, American Wood Impregnation Corporation; L. A. Dunham and Mr. Bruce of R. W. Greef & Company; F. C. Zinsser and Allis Miller, Zinsser & Company; George W. Saums of George W. Saums Company.

"Boost the Railways" Night in New York

MANUFACTURER and supply members of the Metropolitan Section of the American Electric Railway Association will be in charge of the regular meeting to be held in New York on May 8. The fact that the manufacturers and supply men have charge of the program is proof that a record attendance may be expected.

The slogan for the meeting is "Boost the Railways," and the opening address will be made by Lucius S. Storrs, recently appointed managing director of the association. This will be the first address by Mr. Storrs before any division of the association since his appointment. He will point out the way by which electric railway interests can be "talked up" supported by every man connected with an electric railway.

Following Mr. Storrs, two addresses are scheduled. The first is by Harry Vanderveer of the National Pneumatic Company, who will deliver a paper on the pneumatic influence in electric railway operation from the prehistoric to the pay-as-you-enter periods of development, with detailed description of the invention, construction, manufacture, installation and operation of the pneumatic engine, interlocking system, safety guard, signal light, automatic treadle door and some hundred or more other devices, and side notes and references to all principles of pneumatic, electric and mechanical operation.

There will also be an extemporaneous speech by a prominent member of the Metropolitan Section who does not yet know that he will be called upon to speak nor what his subject will be.

The entertainment will include a demonstration by Joseph Dunninger, "The Master Mind of Mystery."

The place of the meeting is 29 West 39th Street and the hour is 8 o'clock. A buffet lunch will follow the addresses and entertainment.

Education

CONDUCTING educational courses for an electric railway property on the "departmental group conference plan" was the center of interest at a meeting of the American Association committee on education held in the office of Edward Dana, general manager Boston Elevated Railway, on April 15. The meeting was attended by Chairman Edward Dana, E. M. Walker, C. S. Coler representing M. B. Lambert, W. J. Edmunds, G. A. Barnes and H. H. Norris.

The committee suggested a number of ways in which the association department of publicity can co-operate with educational institutions, and was gratified to learn that the course in public utility economics, prepared by the extension division of the Pennsylvania State College, is complete and will be ready for distribution soon.

A resolution was adopted urging the association to secure articles on educational topics for *Aera*, the subject of education being considered of importance equal to other phases of electric railway activity. The committee was reinforced in this position by a statement made recently in Boston by President Shannahan, that educational work is the most important present phase of the association's activities.

The principal work of the committee was the preparation and approval of a program for conducting "departmental group conferences," such as have been highly successful during the past season on the Boston Elevated Railway. The education committee formulated specific suggestions for carrying out this plan and voted to request all railway members in the committee membership to try out the plan during the coming season and report results.

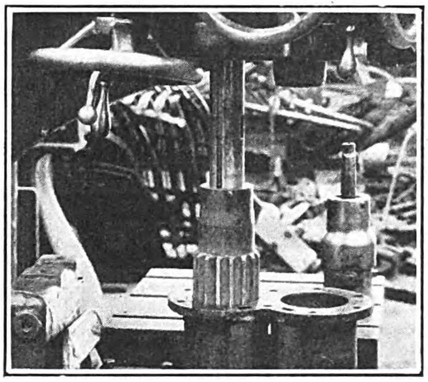
The committee had in hand a wealth of material regarding educational activities of member companies submitted by members of the committee, which will be digested for presentation in the annual report.

Maintenance of Equipment

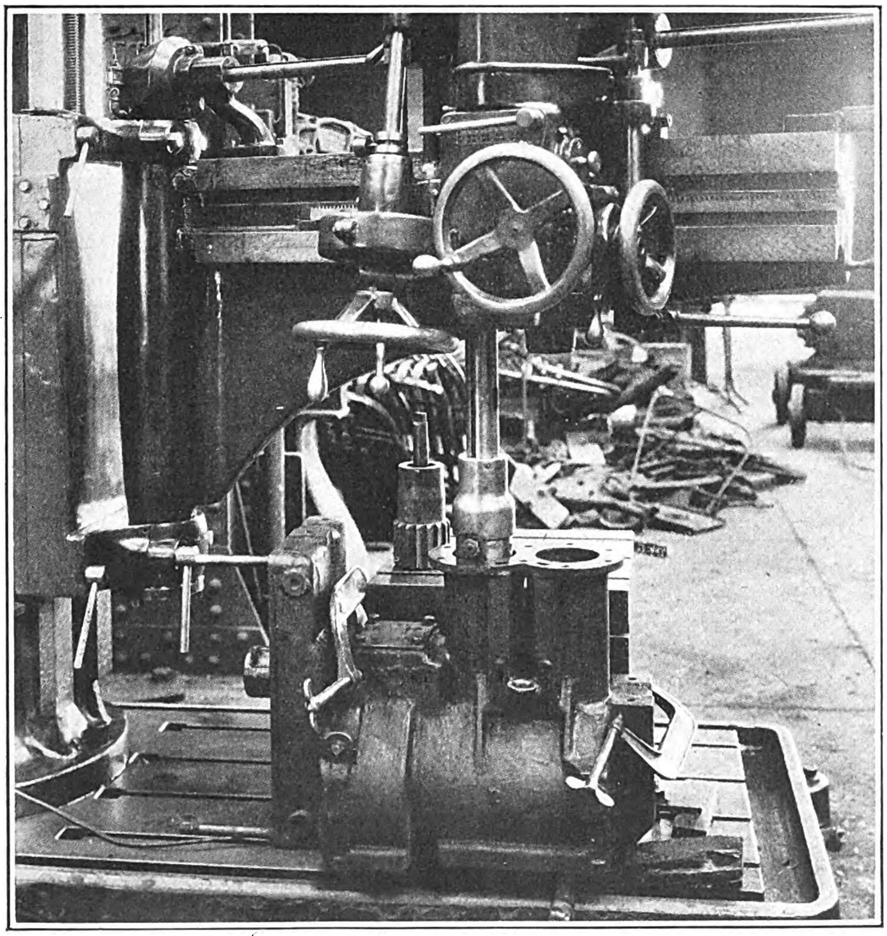
Reboring Compressor Cylinders at Syracuse

WHEN overhauling compressors the practice of the New York State Railways is to rebore a worn cylinder and press in a cast-iron bushing with $\frac{3}{16}$-in. wall. Reboring is done in the Wolf Street shop, Syracuse, on a radial drill manufactured by the Western Machine Tool Works, Holland, Mich. For boring out the cylinders a special boring head has been made which provides for supporting the tool close to the cutting edges so that vibration is eliminated. Boring is done with one operation and the reaming as a second operation. The finish bore of the cylinders is from 0.003 in. to 0.004 in. smaller than the outside diameter of the bushing which is to be pressed in. The bushings for type DH-16 compressors are 10 in. long.

In setting up a compressor for the reboring, it is lined up by using a straight edge across the finished ends of the cylinder so as to line this up with the finished surface of the drill press bed. After lining up, the compressor is held in place with C clamps. A compressor can be set up for boring in from ten to fifteen minutes and the reboring, pressing in of the cast-iron bushings and finishing of the cylinders require about five hours. The accompanying illustrations show a type DH-16 compressor in position for reboring.



The Reamer in Position for Finishing Cylinder



Reboring a Compressor Cylinder on Radial Drill in the Wolf Street Shop, Syracuse

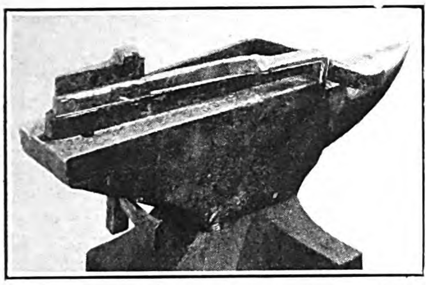
Dipping and Baking Reduces Rewinding

A PROGRAM of dipping and baking railway motor armatures was started in 1922 by the Department of Street Railways, Detroit, Mich. A clear Sterling varnish is used, and the armatures are heated before they are dipped. They remain in the varnish until bubbles stop coming to the surface. At the end of the year 1924 the process had been completed on about 70 per cent of the armatures in service. The average number of armatures rewound per month has been reduced from 77 in 1922 to 50 in 1923 and to 29 in 1924. Officials of the department state that this improvement is due almost exclusively to the dipping and baking process. A still further reduction is expected in the number of rewound armatures when they all have been dipped and baked.

Fixture for Bending Radial Bar Rests

WHERE wrought steel parts are to be bent to a complicated form a jig is essential to insure that the parts are made to the proper shape. It is also easy to place stops on such jigs that will determine exactly the length of material to be used so that measuring is not necessary. The accompanying illustration shows a fixture used in the 155th Street shop of the Eighth Avenue Railroad, New York City, for bending rests used for radial bars. This fixture is arranged to fit in the hardie hole of the anvil. Its use saves much time in the bending operations. The rests are made of 1½-in. x ½-in. bar steel.

The forging operation consists of making a right-angled bend near the right-hand corner, as shown in the illustration. The iron is then bent around the left end of the fixture, so as to make a sharp bend, which is



Fixture Used for Bending Rests for Radial Bars in the Eighth Avenue Railroad Shops, New York

approximately a 15-deg. angle. The third bend made, which is a right-angled bend, is that at the back right-hand end. This is then brought down to shape the hook support. This latter short bend is made with a forked fixture. With this jig accuracy is assured and much time is saved in the operation.

Use of Knuckle Joint Connectors

KNUCKLE joint connectors are generally used for completing the electrical circuits to railway motors and for various equipment connections on cars. Where the connection made between pieces of apparatus is to be permanent, this type of connector should not be used, but either a soldered joint or a permanent type connector should be employed.

In opening a circuit, it should never be necessary to use a hammer to break a knuckle joint connector. If the connector becomes stiff, it should be cleaned with a file until a fit which can be broken with the hands is obtained. The use of a hammer to break a connector makes it almost impossible to put the connector together again satisfactorily.

When using the knuckle joint connector to make the connection between the motor cable and the car cable the connector should be placed in a stationary part of the cable and not in the swinging loop, otherwise a hard spot is liable to occur and the cable will break at this point.

Truck Standardization Reduces Maintenance

SOME time ago the Des Moines City Railway decided to standardize, as far as possible, its car trucks, motors and wheels. Old motors were replaced by modern GE-247 equipments, and 26-in. wheels were adopted as standard on the property.

A number of Brill 27-G trucks had been used previously in service with older motors and larger diameter wheels. When the motors were replaced the trucks were still in good condition, but it was desired to use 26-in. wheels so as to have only one standard for wheel size and motor equipment on the property. This was accomplished by rebuilding the trucks.

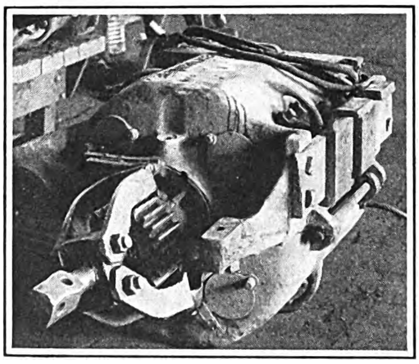
New wheels and axles were used with the old truck side frames. To take the 26-in. wheels, the end frames and brake rigging were shortened. The side links were swung outward so as to clear the smaller wheels. The total cost of this work amounted to about half the cost of new trucks.

As a result of the completion of this standardization program and the installation of new motor equipment the maintenance forces have been materially reduced. The total electrical force in the shop working on motor overhaul, armature repairs and wiring consists of only three men and a foreman.

Screw-Type Pinion Puller

A TYPE of pinion puller with two jaws to go back of the pinion and a screw for producing the pressure is used in the Utica Park shops of the New York State Railways, Utica Lines. This pinion puller is a shop-constructed piece of equipment. A special feature consists of arranging the fulcrum point for the two jaws close to the center of the pinion, so that the grip on the pinion increases as pressure is applied.

In construction, the pinion puller is built up about a large nut which serves to mount the two jaws and which is also tapped out in the center for the screw through which pressure is applied. The outside end of the screw has a square head with holes through which bars are placed for turning. The jaws are open, so that the two sides fit into the teeth of the pinion and the back end projects down so as to give a firm grip for removal.

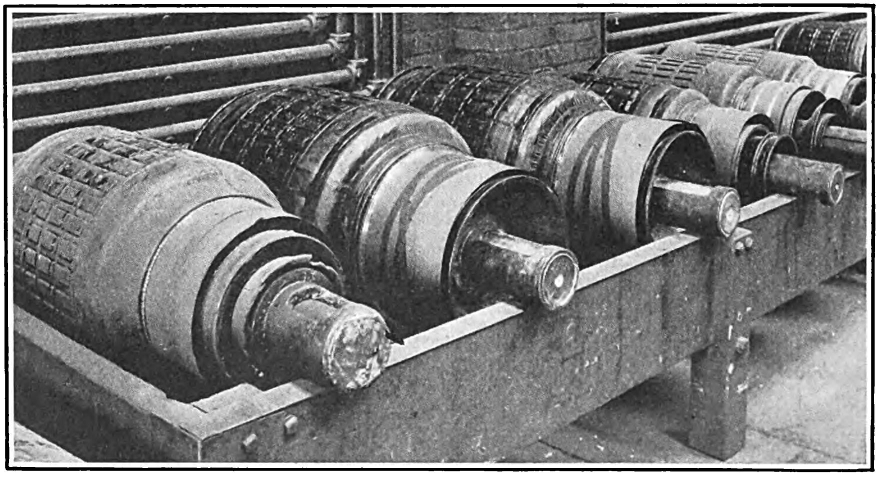


Pinion Puller with Jaws that Tighten as Pressure Is Applied

Protecting Commutators from Dirt During Storage

AFTER armatures have been rewound or repaired, a considerable time frequently elapses before they are installed in motors. It is quite essential that no dirt be allowed to collect in the slots where the mica has been undercut between commutator bars. As a protection to the commutators after the armatures have been repaired and are awaiting installation in cars, the practice in the Wolf Street shop of the New York State Railways, Syracuse, is to tape on a cardboard cover. This effectively prevents damage to the commutator and keeps out dirt and moisture.

It also will be noted that each armature is equipped with bearings. It is the practice in Syracuse to fit each bearing to the particular shaft with which it is to operate, after which the bearings are kept with the armature.



Cardboard Covering, Held in Place by Tape, Protects Commutators

New Equipment Available

Renewable Fuse

A KNIFE-BLADE type of renewable fuse with but six elements has been developed by the Johns-Pratt Company, Hartford. Conn. The six elements include the knife blade with renewable links, a two-part spacing and lock washer, two end caps, and a fiber tube with two threaded metallic ends. The fuse links of the knife-blade elements are made in sizes ranging from 61 amp. to 100-amp. capacity and have slotted ends so that loosening of two bolts is all that is required to permit their release and replacement. In types of larger capacities which include fuses for 110 amp. to 600 amp., complete assembling of the bolt is required as the ends of the links are not slotted.

Improved Circuit Breakers

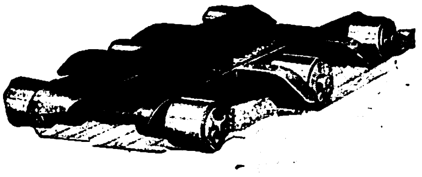
THE new General Electric type MR circuit breakers for electric railway service have improved current rupturing characteristics over previous designs, due to the powerful magnetic blowout and the use of arc suppressor plates. The rupture is complete, in case of short circuit, in approximately 0.03 second, about half the time required by the previous ones.

A heavy compound base, held in the box by three cap screws, supports all of the operating mechanism. Examination of the contact tips may be made easily by the removal of the arc chute, which is held in place by a single latch attached to the box in such a way that it can be moved only when the cover is open.

The new models include the following continuous ratings: MR-20-A, 15 amp.; MR-21-A, 70 amp.; MR-22-A, 140 amp.; MR-23-A, 240 amp.

Light-Weight Shop Trucks

A NEW line of hand-drawn shop trucks is being introduced to the market by the Marion Tool Works, Inc., Marion, Ind. Solid metal construction is used throughout, which makes the dolly light but still sturdy enough to handle heavy loads. The trucks are equipped with steel axles and wheels and with roller bearings. They are built low to the floor and have no sharp edges, which might damage equipment. Holes are provided for attaching special skids, removable platforms or special bodies where desired.



Roller-Bearing Hand Trucks

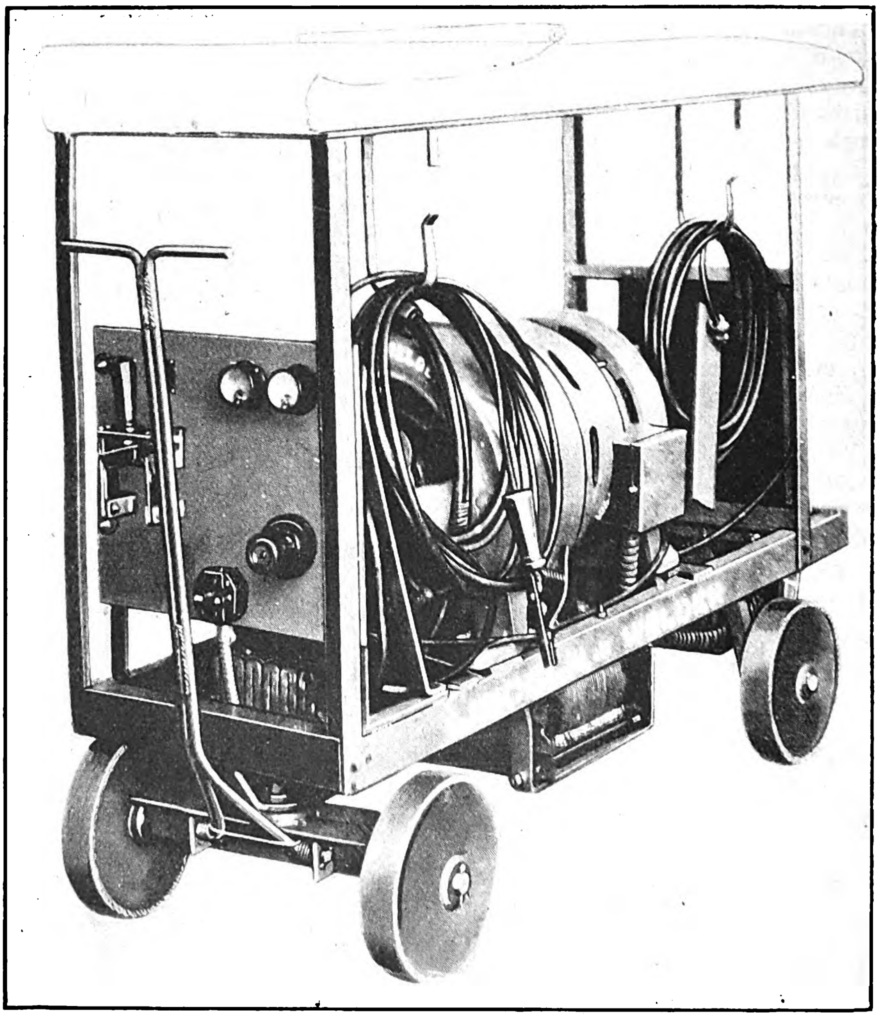
The skid projections make this type of dolly particularly easy to load and unload, and the roller bearings make it possible for one man to handle heavy loads. By means of a lock the wheels are fastened sidewise while the truck is being loaded, so that accidents which might result from the truck drawing or creeping away are prevented.

Portable Arc Welder

UNUSUAL ease in operation is claimed for a new portable electric welder especially designed for use in railway shops which has been put on the market by the Lincoln Electric Company, Cleveland, Ohio. The equipment is said to be especially well adapted to shop work because of its relatively narrow width, which is but 21 in., so that it will pass readily through the narrow aisles found in some railway shops.

The machine is low to the floor so that it will not tip over. The frame is of structural steel, extending beyond the equipment so as to protect it from damage. The stable-arc method of welding is used, which is said to revolutionize old ideas of welding. The new equipment is of 300-amp. size, which has been found to have the greatest economy in railway work.

The stable-arc method provides a steady, uninterrupted flow of heat, enables the operator to handle the equipment with ease, and gives great speed and a high quality of work. A push-button starter, tool box handy but out of the way, spring controlled handle which is out of the way when not in use, handy cable hooks, and light total weight are some of the other features.



Truck Mounted Arc Welder for Shop Use

The News of the Industry

Service-at-Cost Suggested

Conferences at Buffalo Believed to Have Resulted in Bringing City and Railway Together

City-company co-operation as a means of solving the traction problems of Buffalo, N. Y., was agreed upon at a series of conferences attended by representatives of the International Railway, Mitten Management, Inc., members of the Buffalo City Council, a committee of the Chamber of Commerce, the Public Service Commission and publishers of the daily newspapers in Buffalo. Members of the City Council are now investigating municipal supervision over traction lines in other cities, particularly Cleveland, and newspaper owners have turned an about face from their former hostile attitude.

PARTNERSHIP ARRANGEMENT FAVORED

Details of the series of conferences were withheld from the public by agreement, but it is known that officials of the International Railway are prepared to consider a service-at-cost plan of operation under the supervision of a commissioner appointed by the city with close co-operation between the management of the railway and the municipal authorities.

Later conferences held between representatives of the railway and the municipal authorities considered immediate improvement in service, the matter of paving between the tracks on certain streets and the betterment of rails and equipment and more adequate supervision over the spacing of cars to prevent bunching and traffic delays.

Mayor Frank X. Schwab, who has been continuously harassing the management of the International, announces that he is well pleased with the results of the first series of conferences. Representatives of all city interests discussed the traction problems freely and the newspaper publishers are reported to have consented to withhold criticism of the railway pending the outcome of the present negotiations. This was the first time that various interests in Buffalo have had a heart-to-heart talk with executives of the railway and Mitten Management, Inc., regarding the traction problems of the city.

MANY PROMINENT MEN ATTEND

Among those who attended the first conference were: Thomas E. Mitten, chairman of the executive committee of the International Railway and president of Mitten Management, Inc.; Herbert G. Tulley, president of the International; J. A. Queeney, vice-president of Mitten Management, Inc.; B. J. Yungbluth, vice-president of the International Railway; Mayor Frank X. Schwab and members of the City Council, except Commissioner Frank C. Perkins, the Socialist member of the board, represented the municipal government. Commissioner Perkins believes in public discussions. N. L. Danford, president of the Buffalo Chamber of Commerce; J. P. Williams and G. C. Lehman represented the Chamber of Commerce, and five local newspaper publishers also were present with members of the Public Service Commission.

In a joint statement signed by Mayor Schwab, Mr. Mitten and Mr. Williams, the conference informed the public that there will be detailed consideration at future meetings of the Cleveland, Detroit and Rochester plans of municipal supervision. The offer of the International Railway to submit a digest embracing portions of the three plans best adapted to the city of Buffalo was accepted. Pending consideration of the city-company plan, the railway has agreed to co-operate with the city so that every possible improvement in service can be made at once.

After the third conference, Mayor Schwab issued a formal statement saying he is not in favor of the city buying the local properties of the International Railway at any price or the city assuming any financial obligation in regard to the company. He said that neither of these must be done under the Tayler system now in operation in Cleveland. After an inspection of conditions in Cleveland Mayor Schwab said he found that the service-at-cost plan had worked successfully in that city for fifteen years.

Worcester-Leicester-Spencer Service to Be Restored

The Worcester Consolidated Street Railway, Worcester, Mass., which abandoned its Worcester, Leicester and Spencer line early last winter, has announced that service on the line will be restored about May 1. The resumption will be accompanied by a reduction in fares for those who do not use the weekly ticket. The fare from Worcester to Spencer will be 40 cents instead of 45, to Leicester 20 cents instead of 24 and to Cherry Valley 10 cents instead of 17. Express service between City Hall, Worcester, and the Leicester line is planned.

The proposed new rates will be accompanied by a change in zone charges and fare limits. There will be four zones instead of six and the zone charge will be 10 cents instead of 7 cents. The company will put into effect a $1.25 weekly ticket for riders who commute from St. Joseph's Church in Leicester to Worcester. Passengers will be permitted to ride between Spencer and the Worcester city line for $2.50 weekly and between any point in Leicester and the city line for $1.75. From the city line of Worcester to the local city hall the cash fare will be 10 cents.

Bus Grant Accepted

Stage All Set to Begin Operations in Kansas City with 60-Car Fleet —Negotiations Ended

The three-year bus franchise, the ordinance for which was passed by the City Council on April 6 and approved by Mayor Albert I. Beach on April 7, was formally approved by Judge Kimbrough Stone, referee in the receivership of the Kansas City Railways, on April 20. Judge Stone, on the latter date, held a formal hearing on the franchise ordinance to give the company's creditors an opportunity to enter objections to the expenditure involved in the event that the company starts a bus system.

When no objections were offered at the hearing, Judge Stone authorized the receivers of the railway to accept the terms of the ordinance and to expend any required amount up to $750,000 for buses and equipment. Thus ended the fight for bus transportation in Kansas City, which has been in progress almost constantly since December, last year.

Fred G. Buffe, general manager for the receivers, said that plans for a thoroughly modern garage for about 65 to 70 buses would be finished at once, construction to begin immediately. He said that the final decision as to the make of buses to be used had been made and the deal for the purchase of such equipment will have been consummated within the next two weeks. The first bus line will probably be in operation July 1. Under the terms of the franchise, the first line must be established by the latter part of July and two additional lines must be started each month until the nine routes are in operation.

Col. Bennett Clark, St. Louis, Mo., was present as spokesman for the reorganization committee. He approved the proposed bus project and specifically waived all objection to certain provisions of the franchise in view of the short term of three years during which it is to be effective.

In approving the bus ordinance and sanctioning the acceptance of the franchise by the receivers, Judge Stone is said to have indicated that certain provisions of the ordinance would have necessitated very careful study had the duration of the franchise been for a longer period of years.

Francis M. Wilson, one of the receivers, said:

> We have the required authority now, but we are not going to rush into the purchase of buses. We will be guided by caution, not by a desire for speed, and we intend to avoid mistakes, if we can, in purchasing equipment. This is an experiment in bus operation and we desire the new service to have a fair chance to prove its merit and practical worth. It is true that we have already agreed upon the make of vehicle to be purchased.

Mr. Wilson said that he is confident that the new garage will be as modern and efficient as could be desired. Three of the officials of the company are said to have just returned last week from a tour of inspection of garages in Chicago, Detroit and St. Louis, Mo.

Mr. Buffe said that there are to be nineteen double-deck buses, 41 single-deck ones and four special buses in the initial outlay, which is to furnish accommodations for the nine routes, one of which will have express service.

Mayor Beach is said to have expressed his gratification upon hearing of Judge Stone's approval of the bus franchise. He said that Kansas City needs buses badly and pledged the city to co-operate in every possible manner with the railway receivers in the operation of the buses.

Service-at-Cost Contracts Approved for Missouri Cities

Service-at-cost contracts between Missouri municipalities of 100,000 population or more and electric railways, bus companies and other common carriers are now possible under the terms of an enabling act passed by the Missouri House of Representatives on April 1. The bill had previously been approved by the Senate, but goes back to the Senate for concurrence to minor amendments tacked on in the House. The bill was sponsored by Bennett Clark, attorney for the organization committee of the Kansas City Street Railways. The measure applies to St. Louis, Kansas City and St. Joseph. Under the measure cities cannot enter into a contract for a period longer than 30 years without the approval of the voters.

Staten Island Tunnel for Passengers

Governor Smith of New York has approved the Hofstadter bill providing that the Brooklyn-Staten Island tunnel may be constructed by the Board of Transportation with the approval of the Board of Estimate and appointment of the city of New York instead of "shall be constructed by the Board of Estimate and Apportionment," and that such tunnel if constructed shall be for rapid transit purposes exclusively.

The Governor based his reasons for signing the bill upon the fact that it seems to be the weight of engineering opinion that it is not practical to operate rapid transit trains on the same tracks provided for freight and the wishes of the people of Staten Island for transit facilities.

The Governor explains that the tunnel as designed calls for an expenditure of approximately $60,000,000, while a tunnel designed for rapid transit would call for an expenditure of about $22,000,000. He says this money could well be applied to the construction of additional subways and that the business thing to do is to change the law, give Staten Island her rapid transit tunnel at the earliest possible moment, let the freight feature be cared for under the comprehensive plan of the Port Authority, drawn to feed all five boroughs of the city, having behind it the sanction of New York and New Jersey.

Transportation Problem in Pomona Remains Unsettled

The future operations of a bus system to supply Pomona, Cal., citizens with transportation appears to be somewhat a matter of doubt, as recent investigations by the citizens' committee show it legally impossible for the city to subsidize the City Transit Company to make possible the guarantee of local bus service. Furthermore, it was found impracticable for the city to acquire by purchase or lease the equipment of the City Transit Company and operate it as a municipally-owned bus system.

Based upon the unsatisfactory findings of the committee the Mack Motor Bus Company of Los Angeles, it is reported, stated service would be discontinued as soon as the city had filed notice of its inability to support the bus system. The Mack concern holds title to the bus equipment, on account of the failure of the City Transit, Inc., to meet payments on the layout of equipment. The City Transit Company is some $13,000 in the "red" as a result of six months' operation.

The bus system was put into operation on Sept. 15, 1924, and was undertaken after the Pacific Electric Railway had been authorized by the California State Railroad Commission to discontinue its local one-man car service. The abandonment was allowed on the plea of the company that its local lines in Pomona were being operated each year at a distinct loss. Finally the commission authorized the company, after discontinuance of service, to remove physically its tracks from the streets of Pomona, as it formerly operated quite an extensive mileage in the city.

The bus system was a dream of the former Mayor of the city, who was a most ardent sponsor for its establishment under the present manner of ownership and operation, and his death a few days before the service was started in September last was keenly felt.

With the passing of the present system, possibly out of existence, Pomona will be without mass transportation unless the "jitney" type of bus enters the field to be the final solution of the problem.

Arbitration in Atlanta

Possibility of a strike tying up service on the railway lines of the Georgia Railway & Power Company, Atlanta, Ga., was averted on April 16, when officials of Local No. 732 of the Amalgamated agreed to arbitrate demands for an increase of maximum wages paid motormen and conductors. The local union has selected Luther Still, well-known Atlanta labor leader, while the Georgia Railway & Power Company has named C. Murphey Candler as its representative on the arbitration board. The two will select a third member to complete the board. Both Mr. Still and Mr. Candler served last year on a similar arbitration board.

At present trainmen are being paid 43 cents for the first nine months of service, 48 cents for the second nine months and the maximum of 51 cents after they have served a year and a half with the company. An effort will be made by the union, it is understood, to advance each of these rates to trainmen. It was at last year's arbitration that the maximum was advanced from 48 cents to 51 cents an hour.

Present demands include proportionate increases for all other members of the union in the employ of the power company. Although wages have been advanced from 25 cents an hour as a maximum to 51 cents since 1913, the union insists that the wages paid are still too low to meet present-day standards of living. It is asking for a maximum of 60 cents an hour for motormen and conductors.

Because of jitney competition, the power company has refused to consider any demands for increased wages during the past year. With this competition removed and the way paved for an increase in the income of the department, it is possible that some of the demands of the employees can be granted by the company.

Two Arbitrations in Scranton

The Scranton Railway, Scranton, Pa., and its employees are in the midst of two separate and distinct arbitrations. One of these concerns the suspension of Motorman Harry Laymon and the other concerns the question of wages and contract for the coming year.

For violation of rules at the New York, Ontario & Western Railroad crossing in the Borough of Mayfield, endangering the lives of some 55 people, Motorman Harry Laymon was suspended on Feb. 15, 1925. The union took exception to the company's ruling. It threatened a strike if he was not reinstated and paid for all time lost. W. B. Fitzgerald, international vice-president of the Amalgamated, went to Scranton and insisted the men withdraw their strike threat and live up to the contract. This agreement, effective from April 1, 1924, to April 1, 1925, stipulated that in the event the differences could not be settled arbitration was to decide the issue. The company has selected as its arbitrator D. R. Reese, general counsel of the Delaware, Lackawanna & Western Railroad and president of the Lackawanna Motor Club. The union has selected Frank Walsh, business agent of the garment workers' union. No agreement has been reached on the third arbitrator.

In the draft of contract submitted by the union there were a great many changes in working conditions and a demand for an increase in wages of 16 cents an hour for all crafts. After two days discussion the company refused to grant any of the requests except to make two concessions regarded as mutually advantageous. The company offered to renew the old wage scale and operate under the existing conditions. This the union failed to accept, and after a meeting and a strike vote, which was lost, it notified the company that it would arbitrate the wage case. The company thereupon selected John M. McCourt, member of the law firm of Knapp, O'Malley, Hill & Harris and the same arbitrator as last year, while the union selected L. F. Hart, its business agent, also the same man selected last year. The third man has not been selected.

P.R.T. Fare Hearings to Be Resumed

Hearings on the Philadelphia Rapid Transit Company's fare rate case will be resumed before the Public Service Commission in Harrisburg on April 29. The commission stated that the date was set after consideration of a petition and complaint filed recently by the United Business Men's Association, which sought to procure revocation of the present 8-cent fare order. Since the filing of that petition the city has decided to join the fight to reduce fares. The commission stated that it had also notified Milo R. Malthie, New York, who has been investigating the Philadelphia case for several months, to be prepared to submit his final report.

The answer of the company was filed with the commission on April 15. It admits certain facts that the petitioners allege, but denies generally the assertions relative to the company's earning capacity. The company admits that the wage requirements for 1924 were met and that the fare, 8 cents cash or two tokens for 15 cents, has been in effect since Sept. 25, 1924, and that the company's balance sheet shows a surplus of $5,600,000. Of that balance, however, it is said, a large part was earned in 1924. The rest represents accumulations since the formation of the company. During many of these years no dividends were paid upon the company's stock.

Bus Plan for Norfolk Goes Before Public

A public hearing was held in Norfolk, Va., on April 16 on the ordinance providing for control of bus transportation by the Virginia Railway & Power Company. The City Council advisory transportation committee of Norfolk has approved the proposal of the railway company for bus operation in the city. The plan that was suggested calls for universal transfers between street cars and buses, with a general bus fare of 7 cents and a provision for school tickets. Mayor Tyler has announced that the Council will seek public reaction from all sections. Copies of the proposed ordinance were prepared for distribution, as the Council desires that the public understand the plan from every angle.

Independent bus operators who have invested money in motor vehicles have opposed the grant of the permit to the company, as the traction company proposes to take over the bus equipment now in service wherever possible. The Bus Association, Inc., representing the majority of independent operators, is unwilling to surrender the business of its members without a fight and has filed a 3,000-word attack on the plan. The document refers to the rights of the independent bus operators, favors competition and prophesies higher fares.

It was announced in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 31, 1925, page 199, that the company was ready to submit a plan for the operation of buses in Norfolk in co-ordination with or as an auxiliary to its railway system there. At that time it was stated that the company was willing to reimburse operators of bus routes which it took over on the appraised value of the equipment by a board of arbitration, if the company and owners were unable to agree. Further, that the company was willing to begin the operation of buses without additional legislation from the Virginia Assembly.

Straight Seven-Cent Fare Refused in Shreveport

Chairman Huey P. Long of the Louisiana Public Service Commission has refused the application of the Shreveport Railway for a blanket 7-cent fare and has granted the company a 7-cent cash fare with lower rates for those who purchase tickets. The order granting the company a 7-cent cash fare requires the sale of four tickets for 25 cents, 6¼ cents each, and the sale of a block of seventeen tickets for $1. In his finding Chairman Long said:

> With the exception of a few lines one-man cars should be operated. It is quite evident that on some of the lines a great saving could be made in this manner. Just what lines should be excluded from this operation of one-man cars, and during what hours, we would not attempt to dictate because the proposition is one for local regulation.
>
> It is testified that jitney buses are being regulated by the city, and that such regulation continues to become of growing benefit to the company's service and the community safety. This also is another matter of local control, but many cities appear to have adopted a similar course.
>
> We are reminded that the company is forced to pave streets. It is not our function to pass upon the question of the reason why such an obligation can be justified.
>
> If we order a fare in this case that tends toward constantly diminishing the number of car riders, the problem may never be solved. But if, on the other hand, we can see our way clear to order a somewhat better fare, such as will encourage car riding, the company's relief may be brought to hand. Again, a system of charges that tends to popularize the company's service may inspire a good will that will make much more easy of accomplishment the economies that may appear necessary from time to time.

The railways contended for an increase in fare from 6 cents to 7 cents per passenger, including transfers, and not to affect fares of school children. It argues against a reduced rate for tickets.

Operating revenue for the year ended Dec. 31, 1924, was:

Gross earnings	$648,274
Operating Expenses—	
Maintenance of way	$48,603
Maintenance of equipment	77,081
Traffic expense	7,485
Operation of cars	244,589
Power	68,818
General expense	70,250
Taxes and license	45,000
Depreciation	52,543
Total	$614,371
Net income	$33,902
Other income	1,907
Total	$35,310
Less Fixed Charges—	
Interest on bonds	$35,000
Other interest	7,859
Total	$42,859
Net loss	$7,048

Resolution Would Prohibit Tax-Exempt Securities.—The Wisconsin Legislature recently passed a joint resolution asking Congress to submit to the states for ratification an amendment to the Constitution of the United States prohibiting the further issuance of tax-exempt securities by federal, state or local governments.

Unofficial View of Decision in Kansas Case

Substantial legal opinion at Washington takes the view that the decision of the Supreme Court in the Kansas case has been badly interpreted by the press. The decision is thought to be epochal for the reason that it did not outlaw compulsory arbitration. On the contrary, it was made clear that, where a strike would interfere with contractual obligations for the performance of essential public duties, it is within the power of government to compel arbitration.

The inference is that the Supreme Court would sustain a law compelling arbitration in the case of labor disputes affecting operation of the railways or of the telegraph lines. "The power to compel the continuance of a business because affected with a public interest is altogether exceptional, as the court says," a prominent attorney comments, "but it does exist and the court has by no means indicated otherwise."

It is significant that the decision was unanimous.

San Francisco Decides on Duboce Rapid-Transit Tunnel

After several heated sessions before the San Francisco Board of Supervisors concerning the relative merits and disadvantages of the Eureka-Sunset and Duboce tunnel projects, respectively, a decision was reached on April 6 favoring the Duboce tunnel. The cost will approximate $1,600,000, all of which will be met by the proceeds of an assessment of property owners in the district. The assessment plans must be approved by the board.

The route selected is the longer of the two proposed and, unlike the proposed Eureka-Sunset tunnel, the Duboce tunnel will be constructed for street car traffic only. It will connect by the most direct route the Sunset and Eureka Valley districts to the southeast of Golden Gate Park and the business centers of San Francisco.

Case of St. Louis-Kansas City Line Before Commission

Argument on the question of whether the Missouri Public Service Commission should issue a certificate of convenience and necessity to the proposed St. Louis-Kansas City Short Line Railway were heard at Jefferson City, Mo., March 23 and both sides to the controversy submitted final briefs.

Representatives of the steam railroads told the commission the proposed line would cost $60,000,000. They also asserted that the proposed railroad had not secured franchise rights either in St. Louis or Kansas City, its proposed terminals. Further, they alleged the new line would furnish competition destructive to the existing steam lines.

Proponents of the proposed line stated that the steam roads had never furnished service that would develop the territory they plan to serve and are now endeavoring to defeat an effort to give a great section of the state modern transportation facilities.

Adjournment in Albany Fare Case

The United Traction Company, Albany, N. Y., presented to the Public Service Commission on April 17, at a hearing on its petition for an increase in fare from 7 to 10 cents, a valuation figure of $18,113,079, upon which its officials and experts rested their claim that the increased fare be granted to the company on its Capitol district lines. The company claims to have lost $4,000,000 in ten years.

Albany city officials sought a five months' adjournment to permit its expert, Edward W. Bemis, to establish a value for the lines. Chairman Prendergast of the commission said he would allow five weeks. Adjournment was taken to June 1.

The United Traction Company's figures were presented by George H. Burgess, after John E. McLean, counsel for the railway, had declared that the company was unable on the 7-cent fare to pay interest on bonded indebtedness. The city's chief attack, it is reported, will be directed to show that the company is placing too high valuations on the investment for which it may claim a return.

Railway-Bus Plan Delayed in Toledo

The Community Traction Company, Toledo, Ohio, which was scheduled to have submitted a new transit plan for unified street railway and bus operation in Toledo, at a City Council meeting on April 20, asked for more time to permit counsel to go into many difficult questions.

Henry L. Doherty in a letter to the Mayor and Council, read at the session, asked for co-operation in solving the present problems and blamed "selfish politicians" largely for the present status of affairs. He stated that he was sincerely interested in helping Toledo and proposed that the city employ an outside expert to make a transit survey and study of the city. Mr. Doherty offered personally to finance such a study up to $25.000. Otherwise the company will probably have its relief plan ready for Council by May 1.

Mayor Brough, to whom the letter was addressed, advised against the survey, as making for added delay, and recommended that the company bring in its report as soon as possible.

In his letter Mr. Doherty declared that the Milner ordinance "is the best street railway ordinance that was ever drawn and much better than the Tayler ordinance." He declared that the real difference between the two had been that the Milner ordinance had never had the co-operation of the people of Toledo while the Tayler ordinance did receive the co-operation of Cleveland. It was his opinion that if it had not been for the long period of misunderstanding and embarrassment in which the railway system of Toledo had been compelled to suffer, due to the difficulties of reaching an agreement with the city and the lack of co-operation which had prevailed since the passage of the Milner ordinance, a vastly improved condition with respect to railway operation would be the status today.

Mr. Doherty said that it seemed idle to believe that buses could ever compete successfully with a street railway system, but conceded that there was a place in most transportation systems for buses as a supplementary factor and not as a competitor. He also intimated that drastic restriction of private automobile parking in the congested districts would tend to benefit street railway systems.

Amendments Suggested to Michigan Bus Bill

Clarence E. Wilcox, counsel for the Detroit Department of Street Railways, Detroit, Mich., has offered amendments to exempt municipally owned bus lines and certain privately owned buses and trucks from the provisions of the Karcher bill, now before the Legislature. He wants the Michigan Public Utilities Commission authorized to weigh public demand in consideration of permits for bus lines. The Detroit Street Railway Commission's buses operate into Highland Park and other suburban cities. It was pointed out by Mr. Wilcox that the proposed bill would impose a heavy additional tax on these buses and, in addition, it would give the Michigan Public Utilities Commission power over the city's system not intended by the home rule act. In short, Mr. Wilcox wants municipally owned buses exempted, not only for operations within the city but also in a zone reaching 10 miles beyond the city limits, as provided by the home rule act. His proposal was opposed by W. G. Fitzpatrick, attorney for the Detroit United Railway. The amendment providing for the consideration of public demand was also opposed by the D.U.R. attorney on the ground that public demand was a fickle thing, easily influenced. W. F. Evans, president of the Detroit Motor Bus Company, backed Mr. Wilcox. He said preparation must be made for the time when the private automobile will be used less promiscuously than it is now. Detroit jitney operators would be made common carriers by the bill as it stands.

Change in New York Law Approved

Governor Smith on April 13 approved the Nicoll-Hofstadter bill, which will take away from the State Transit Commission the power to modify agreements between the New York City authorities and traction companies operating within the city. The bill was introduced to carry out a recommendation contained in the report rendered by Justice John V. McAvoy following his investigation of the New York City transit situation. The provision in the law repealed by the bill was enacted during the régime of Governor Miller. It proved most objectionable to Mayor Hylan. The Transit Commission was not opposed to the measure. Indeed, Chairman McAneny of the commission insisted that the power was an improper one that should not be continued. The Transit Commission has never exercised the power since the clause was enacted.

Intermediate Permit Law Passed in Oklahoma

The Legislature of Oklahoma has passed a bill known as the revocable permit law, which permits public utility companies engaged in furnishing gas, electricity or water under a municipal franchise to surrender such franchise at any time before its expiration and receive in lieu thereof a permit from the Corporation Commission of the State. The bill provides, among other things, that no company may commence the business of furnishing public utility service in any municipality so long as there is in existence a valid franchise or permit authorizing any other company to conduct in such city or town a business similar to that proposed until the Corporation Commission shall issue a certificate of public convenience and necessity therefor.

Capital Traction Company an Industrial Exhibitor

Washington's first industrial exposition, fostered by the Chamber of Commerce, was held March 21-28 in the new auditorium. About 90 exhibitors displayed products made in the capital.

As a producer of transportation the Capital Traction Company occupied the most conspicuous position on the main floor of the auditorium—a space octagonal in shape with a diameter of 31 ft.

The company's display was so conceived as to be artistic as well as instructional. Columns erected at each angle of the octagon were each surmounted by a small street railway car, painted the same shade of green as cars on the streets. These cars were illuminated at night.

A cabinet about 20 ft. long and 9 ft. wide, erected at one end of the space. was surmounted in the center of the roof by a larger model of a street railway car, and at each corner was a column bearing a large light globe.

Through the front wall of the cabinet, facing the entrances to the hall, was cut a space for the "screen" of an automatic lantern slide machine. On the back wall was a large painting of the Capitol, the Monument, the Lincoln Memorial, a bathing scene and one of a Zoo. At the bottom of this painting two miniature Capital Traction cars were reproduced.

In the automatic slide machine 39 slides were used to illustrate important events in Washington's municipal transportation history and to give essential facts to the public about operating costs, etc.

Two employees of the company were in constant attendance at its booth and 5,000 safety buttons with safety slogans and the company monogram, "C. T. Co.," were distributed, many of them to school children. Several thousand booklets containing facts about the company and copies of a street railway guide to Washington were distributed.

The white, blue and gold color scheme of the display attracted much attention from the 40,000 visitors during the seven days the show was open.

Seats placed at various convenient points offered visitors to the booth a chance to rest for a moment.

Recent Bus Developments

Many Items of Interest Reflecting the Increased Use of the Bus by the Electric Railways—Important Authorizations—Public Service Victor in South Jersey

THE Public Service Railway, Newark, N. J., recently purchased the two independent bus lines owned by Charles A. Aceto in Camden and operated as the Continental Coach Company and the Aceto Bus Company. The purchase price was $100,000. The sale included eight buses. Its consummation removes from the field the last of the independent companies in Camden. In a full-page advertisement in the Camden *Courier* for April 15 Mr. Aceto said that the point was reached where competition between his own company and the Public Service created a deadlock and that the people who needed a better, more efficient transportation system were the real sufferers. He believed that the Public Service Railway could offer that district better service and a 5-cent fare if his companies were not competing, so he felt he should no longer stand in the way. A portion of his statement follows:

> I extend my sincerest thanks to my patrons and friends who have said kind words about my efforts to provide good accommodations and who, when occasion required, marched to City Hall to help me fight my battles.
>
> To fight the public's battle is a marvelous thing, a great privilege, but no man has a right to expect the public to remain loyal, permanently, to any concern which is beset by such circumstances that it cannot render the best possible service. In the face of desertion by some of my patrons, I know that sooner or later my lines would face utter ruin.

Sixty representatives of bus lines in Minnesota met on April 16 with the Minnesota Railroad and Warehouse Commission to consider the terms of the new bus line control bill, which places regulation with the commission. Commissioner Ivan Bowen explained some of the terms of the law and said a set of rules and regulations would be issued later. The companies were warned they must get permits. The companies in operation when the law was passed may continue until applications are approved or refused, and with a permit lines cannot quit without permission and the commission must act on schedule and fare changes. The companies will be asked to file bonds fixed by the commission. They must have satisfactory liability and indemnity insurance. Cities still retain authority to govern bus routes within their limits.

Entrance of another railway into the bus field is heralded by the application of the Olean, Bradford & Salamanca Railway to the city of Salamanca, N. Y., for permission to run buses over certain streets, among them some that lead to the new Allegany State Park, a mecca for tourists and campers. The company also plans to operate buses between Little Valley and Salamanca, following permission granted by the state to discontinue that link of its interurban trolley system. It was shown that this line had been operated at a loss for some time.

Fares on bus lines in Medford, Mass., have been increased by the Boston Elevated Railway, following the granting of a permit by the city government giving permission for the increase. The buses have been operated on a 5-cent fare since they were established. In connection with the increase the Elevated will extend the transfer privileges for local rides and will issue transfers between Medford and Malden cars. The new rate is 10 cents for cash fares or where transfers are issued carrying the rider to the elevated system and 6-cent local fares where five-strip tickets are purchased.

The Washington-Interurban Railroad, Washington, D. C., was granted permission on April 7 by the Public Service Commission of Baltimore to operate a motor bus service between Bladensburg school and East Riverdale. This new line will replace the railway service.

Governor Smith of New York has vetoed the Thayer and Clayton bus bills. Mayor Hylan opposed both these measures and Corporation Counsel Nicholson presented the city administration's objections at the hearing. The Clayton bus bill would extend to all cities the provision that bus lines shall be considered common carriers. That law now applies only to New York City, but the city Assembly amended it by taking supervision over the bus lines away from the Transit Commission and turning it over to the city authorities. Mr. Nicholson said that the Clayton bill was designed to nullify the city amendments, and that the question as to the legality of these amendments was now being contested in the courts. The case is before Supreme Court Justice Wagner. Governor Smith in his veto said that no changes should be made in this provision of the State transportation law pending the determination of that litigation. The Thayer bill would give local authorities the same control over freight carrying bus lines as over passenger buses. Mr. Nicholson declared that it would turn over all of the freight carrying business in New York City to the New York Central Railroad. The Governor vetoed it because it was loosely drawn. He said that those who appeared for it were not quite clear themselves as to the purpose of some of its provisions.

The Des Moines & Central Iowa Company, Des Moines, Iowa, plans to supplement its present rail service with bus lines.

A franchise ordinance was recently introduced before the City Commission of Chattanooga, Tenn., and referred later to the legal department, which would give the Tennessee Electric Power Company permission to operate buses through certain streets to serve sections east of Missionary Ridge. E. D. Reed, manager of the Chattanooga district, and F. G. Spurlock, of counsel, appeared in behalf of the ordinance. The latter explained that the company desires to have a franchise conforming to the laws of the state but seeks no monopoly of the privileges asked. A general clause of the franchise is to the effect that the buses will cover "such other roads and highways in the vicinity as the demand for service may require." The company will furnish a $5,000 bond for each bus to cover loss of life, injury to person, and damage to property. It is set forth that the buses will bear signs as to destinations and fares, will run on regularly advertised schedules, will arrange for the separation of the races as in the street cars and will charge a maximum fare of 15 cents. The buses, Mr. Reed said, would cost in excess of $9,000 each.

The Lincoln Municipal Street Railway, Lincoln, Ill., is preparing to ask the Illinois Commerce Commission for a permit to operate bus lines in conjunction with its railway.

The Tampa Electric Company, Tampa, Fla., will supplement its railway system with a bus service within the next few months. This announcement was recently made by T. J. Hanlon, Jr., manager of the company. Five Mack buses will be put into 30-minute operation on Florida Avenue between Lafayette Street and Sligh Avenue, a distance of more than 5 miles. Mr. Hanlon said that the first buses would be operated as an experiment and if the service proved satisfactory a number of additional supplementary bus lines would be established.

Authorization for two new bus routes connecting the Manayunk and Wissahickon sections with upper West Philadelphia would be given under an ordinance introduced in the City Council recently. If the ordinance is passed, the Philadelphia Rural Transit Company, the bus subsidiary of the Philadelphia Rapid Transit Company, will operate the lines between the places named through Fairmount Park, skirting George's Hill, the Concourse, and the T. A. B. Fountain in the Park, to the Park entrance at Fifty-second Street. The fare will be 10 cents for a continuous ride, with a 3-cent exchange between the buses and P. R. T. surface lines, subway and "L" lines outside the central delivery district. Councilman Walter, chairman of the committee on transportation and public utilities, introduced the ordinance.

With the approval of the Public Utilities Commission the route of the Sixteenth Street bus line of the Capital Traction Company, Washington, D. C., has been extended from the old terminus at Alaska Avenue and Fern Street, out Alaska Avenue to Floral Street, east on that street to Thirteenth Street, north to Holly Street, thence west to Alaska Avenue and return over that avenue to Sixteenth Street.

Franchises for bus lines which will augment the services of the Portland Electric Power Company, Portland, Ore., have been submitted to Commissioner Mann by F. I. Fuller, vice-president of the company, and these will be worked over by Mr. Mann and City Attorney Grant, to present at an early session of the Council. The franchises will affect many streets in the city where street car service now is declared to be inadequate, and particularly in the newly developed and more remote residential sections not reached by car.

Pay Advance Rejected in Cleveland

Members of the union in Cleveland, Ohio, have voted to reject the increase in pay of 5 cents an hour offered, effective May 1, by J. J. Stanley, president of the Cleveland Railway. Mr. Stanley's offer was conditioned upon the men accepting the open shop. The local Court of Appeals has already decided that the present contract between the men and the company is void because of the open shop provision in it.

In rejecting the increase, the men decided to appeal the decision of the Court of Appeals to the State Supreme Court. A hearing to determine whether the State Supreme Court will admit the men's appeal is scheduled for April 28. If the Supreme Court refuses to hear the appeal of the men, officials of the Cleveland Railway are prepared to start operations under the open shop at once.

In offering the men an increase of 5 cents an hour, Mr. Stanley demanded that in case of grievances the men choose either him or a special board of arbitration, rather than continue the present procedure of appeal from operating officials to Mr. Stanley and from Mr. Stanley to a special board of arbitration.

News Notes

One-Man Car Bill in Tennessee.—The House of Representatives passed recently the Whitfield-King-Brown bill to make it unlawful to operate one-man street cars in the large cities of Tennessee. The bill had already passed the Senate. It will eliminate one-man cars in Nashville, Memphis and Knoxville, but was amended so as not to apply to the smaller cities of the state.

Passes Increased to $1.25.—The New Brunswick Power Company, St. John, N. B., recently increased the price of passes to $1.25. This was an increase of 25 cents over the original fee.

Cash Fares Advanced.—The Railroad Commission has authorized the Beloit Traction Company, Beloit, Wis., to raise its cash fares from 5 to 7 cents and the ticket fare from 25 tickets for $1 to sixteen tickets for $1. The rate to school children will remain the same. The decision of the commission was based on the fact that the company operated during the past three years under a rate schedule which was insufficient to provide for depreciation and returns on investment.

Car Crew Successful Sellers of Stock.—The successful use of employees as salesmen in the distribution of utility securities was forcefully demonstrated during the recently completed stock-selling campaign conducted by the Duluth-Superior Traction Company, operating in Duluth, Minn., and Superior, Wis., through which 1,986 customer owners were added. In commenting on the sale of this $1,500,000 stock issue, Herbert Warren, vice-president and general manager of the company, praised the efforts of the car crew salesmen in view of the fact that the sale was carried on almost entirely by them, aided by newspaper advertising.

Two-Fare Zone Method in Effect.—The Boston & Worcester Street Railway recently started experimenting on a two-fare zoning system on the Union Avenue line in Framingham, Mass. The fare on this line from Concord Street to Central Square has been 10 cents. The change involves a 5-cent fare from Concord Street to Lakeview Avenue and a 5-cent fare from Lakeview Avenue to Central Square.

Seeks Ten-Cent Fare.—Officials of the Columbus, Newark & Zanesville Electric Railway have petitioned the City Council of Zanesville, Ohio, for permission to charge a 10-cent fare.

Lower Sunday Fares to Beach Resorts.—The Pacific Electric Railway started on April 12 a special round-trip Sunday rate between Los Angeles and nearby beach resorts, including Seal Beach, Long Beach, Wilmington, San Pedro, Redondo Beach, Hermosa, Manhattan, El Segundo, Playa del Rey, Venice, Ocean Park and Santa Monica. The fare is reduced from 70 cents to 50 cents and the change is in the nature of an experiment to determine if opportunity exists for the development of an increased service commensurate with the decreased charge. Tickets will be available for use only on the day purchased and the new plan will remain in force until a decision can be made as to permanent policy.

Provides New Transfer Points.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., announced recently 36 new transfer points on seven trolley routes serving the northern section of the city. These additional free privileges will enable riders to journey between points along Germantown and Wayne Avenues and points on Old York Road for one fare within the city limits.

Youngstown Men Win Trophy.—For operating cars in Youngstown, Ohio, for more than 60 days without a chargeable accident, a team of eight workers was presented a beautiful bronze safety statuette by Isaiah Gordon of the Bureau of Safety, Chicago. Cars operated by these men traveled a distance of 38,477 miles. In winning the trophy the Youngstown team defeated picked teams in Chicago, Milwaukee and Wisconsin.

Fares Reduced.—The Worcester Consolidated Street Railway has made two changes in fare rates to benefit passengers on the Worcester, Clinton and Leominster, Mass., divisions. A change in the zone limits between South Lancaster and Clinton makes the charge between those two points 7 instead of 14 cents. The fare limit has been extended to the post office at Morningdale instead of at Woods switch, making the fare from Worcester to that point 10 instead of 17 cents.

Railway Men Subject of Comment.—The Louisville *Times*, which has been running a series of short biographical sketches of leading business and professional men of Louisville, Ky., recently printed a résumé of the doings of James P. Barnes, president of the Louisville Railway. Another of the sketches dealt with Frank H. Miller, vice-president and general manager of the Louisville Railway.

Approves Operation.—The New York Public Service Commission issued an order on April 16 approving the operation by the Westchester Electric Railroad of its cars in the village of Tuckahoe to the western end of the bridge over the tracks of the Harlem division of the New York Central Railroad. The commission recently approved a declaration of abandonment of part of the line which provided that cars should stop at the eastern end of the bridge. The village later asked the company to operate to the western end of the bridge.

No Single Fare in Twin Cities.—With the session of the Minnesota Legislature about to end there is no prospect of passage of the bill to permit the State Railroad & Warehouse Commission to make a single trolley fare for both Minneapolis and St. Paul. The proposed "metropolitan district" law was killed by the general legislation committee of the House. St. Paul Representatives urged passage of the bill on the gound of simplification of administration and saving of money thereby for the carriers. Minneapolis Representatives objected to the bill because the Minneapolis trolley earnings are greater and the law would penalize patrons of the Minneapolis Street Railway. The Senate refused to advance the bill to a point where it could be reached before the end of the session. For a similar reason, that it will not be reached, the bill is dead that was intended to restore a neutral fare district in the St. Paul Midway, giving Minneapolis a single fare to Snelling Avenue, St. Paul, which it formerly enjoyed. This leaves the median line between the Twin Cities as the end of the single fare on the four interurban lines.

Safety Premium Plan Extended.—The Board of Control of the Richmond Safety Council recently adopted resolutions commending the "safety premium plan" of the Virginia Railway & Power Company. The plan was started last summer and resulted in the distribution of $10,000 to the trainmen just before Christmas of last year. This sum represented one-half of the amount saved by safe operation during the last 6 months of the year. The plan has now been extended for another 6 months. When the plan was started in August, 1924, the company announced that any reduction in the percentage of losses, due to accidents, which amounted to 5 per cent of the gross earnings of $2,400,000 during the first 6 months of 1924 would be divided between the company and the men on a 50-50 basis.

Group Insurance for New Jersey Employees.—All employees who have been in the service of any of the subsidiaries of the Public Service Corporation of New Jersey, Newark, N. J., for a year or more will be eligible for a minimum life insurance policy of $1,000 without physical examination and at a very low rate. Announcement to this effect was made on March 2 by the welfare department of the corporation. The group life insurance plan involves a total insurance of between $15,000,000 and $16,000,000 and affords protection to 12,000 men and women workers.

Financial and Corporate

Reorganization of Kansas City Railways Ahead

Judge Kimbrough Stone on April 11 announced that May 11 is to be the tentative date for a hearing before him on a final order for foreclosure and sale of the properties of the Kansas City Railways. It is said that this formal step in the reorganization is to be preceded by a hearing on May 1, open to any creditor with rights which have not yet been adjudicated. This hearing is expected to be merely a formality, since the principal creditors and participants in the litigation are said to have approved the language in the decree of sale prepared by R. J. Higgins, attorney for the trustees under the first mortgage.

Senator James A. Reed is said to have taken advantage of the opportunity to urge the setting of definite dates for the hearings. He represents the large personal injury claimants who have settled with the reorganization committee for approximately $2,000,000. The Senator was present at the bus ordinance hearing before Judge Stone on April 20.

The foreclosure order is considered as a preliminary move to a reorganization plan virtually similar to a plan which was drawn up several months ago, but never submitted to the courts for approval. One of the receivers is of the opinion that the railway will probably be turned over to a reorganized company to operate some time in the fall. It is said that a revision of the plan for reorganization will be submitted to the note and bond holders, but this is not expected to be done until after the final order of foreclosure and sale of the property.

Priority of claims against the property will, of course, be established by the order of sale, but interests holding claims which are secondary to those of the large personal injury claimants will still have recourse to their appeal rights and may appeal on exceptions and argue for better settlement terms than those which have already been offered by the reorganization committee.

The holders of the second mortgage bonds made every effort to obtain a better settlement than was at first offered. It is understood that no satisfactory offer of settlement has been submitted to J. Ogden Armour, who loaned to the Kansas City Railways about $1,500,000 just before the receivership. As for the stockholders, the degree of their participation in the affairs of the reorganized company has not been announced.

City of Seattle Must Pay Tax on Railway Properties

In a decision handed down by the United States Circuit Court of Appeals in San Francisco, it was indicated that the city of Seattle, Wash., must pay taxes on street railway properties assessed against the Puget Sound Power & Light Company in 1919. Court attachés and experts expressed inability to interpret the decision closely, but said it indicated that the city would be compelled to pay three-fourths of the tax assessed against the railway, while the company which sold the railway to the city would have to stand the rest. The court specifies that the remaining findings of the lower court will stand.

After a long contest through the lower courts, the company appealed to the United States District Court for an order to prevent the King County Sheriff from placing liens upon the company's property. The petition was dismissed. The company then paid the whole tax under protest, to save from the threatened liens that portion of its properties not affected by the tax. The court refused the temporary restraining order, and the company appealed to the United States Circuit Court. The tax involved and paid by the company under protest was $482,000. Of this sum the company contends that the city of Seattle, under its contract of purchase of the railway, should pay three-quarters.

Increase in Business on North Shore Line

Gross and Net Income Greatest in History of Highly Developed Chicago-Milwaukee System—Comparative Earnings Statement for Nine Years an Instructive Exhibit

Earnings of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., showed a substantial increase in 1924 over the previous year. Gross operating revenue was the greatest in the history of the railroad.

While the increase was less marked than in some previous years, the gain of $253,715 in operating revenue may be regarded as very satisfactory, in view of the fact that part of the year 1924 was a period of general business depression, felt in all industries and in all parts of the country.

The steady growth of the company's business since the property came under the present management is best seen by the following comparison of gross operating revenue per mile of road: 1916, $12,688; 1917, $19,203; 1918, $31,798; 1919, $33,278; 1920, $40,558; 1921, $43,528; 1922, $48,472; 1923, $57,498; 1924, $59,962.

INCOME ACCOUNT OF CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD
For the Year Ended Dec. 31, 1924

Operating Revenue:		
Passenger and special car revenue	$5,031,479	
Freight and express revenue	1,048,447	
Miscellaneous revenue	119,060	
		$6,198,986
Operating Expenses:		
Way and structures	483,816	
Equipment	417,566	
Conducting transportation	2,058,972	
Power	534,885	
Traffic	210,408	
General and miscellaneous	944,383	
		$4,650,029
Net revenue railway operation		$1,548,957
Net auxiliary operating revenue		799
Net revenue from operations		$1,549,756
Taxes assignable to railway operations		298,608
Operating income		$1,251,148
Non-operating income		60,154
Gross income		$1,311,302
Deductions from gross income		610,582
Net income		$700,720
Surplus, Jan. 1, 1924		$350,237
Deduct: Sundry adjustments applicable to prior years		17,440
		$332,797
Net income, Jan. 1 to Dec. 31, 1924	$700,720	
Less: Dividends paid	393,300	
		$307,419
Surplus as per balance sheet		$640,216

In 1923 the Chicago, North Shore & Northern Railroad was formed, with a nominal capital stock of $50,000, to acquire a right-of-way and construct a railroad through the Skokie Valley. The stock of the company is held by the Chicago, North Shore & Milwaukee Railroad. It was acquired to protect the railroad from the interruption in service following grade separation work. The company deemed it essential to provide a new outlet for through passenger traffic between Chicago and Milwaukee. The new line will permit the operation of through trains at high speed, reducing the running time between the two cities, in addition to opening up a territory which in the near future should prove a source of considerable traffic. Another advantage of the new line is that freight trains may be operated over it between Evanston and Highland Park. Under present conditions the company is prohibited by ordinance from operating freight trains south of Highland Park.

In June, 1924, the company issued $3,500,000 one-year notes to provide funds for building the line until a permanent plan of financing could be effected.

SALE OF PREFERRED STOCK SUCCESSFUL

At a meeting of stockholders of both companies, held Oct. 6, 1924, a consolidation of the two companies was effected under the name of the Chicago, North Shore & Milwaukee Railroad. In December the consolidated corporation was authorized to issue and sell $7,000,00 first and refunding mortgage 6 per cent gold bonds to retire the $3,500,000 one-year notes, all of the three-year, ten-year and fifteen-year sinking fund notes, and for other corporate purposes. Owing to legal technicalities this could not be consummated until January, 1925, so that the transaction does not appear on the balance sheet in the 1924 report.

The sale of the first issue of $1,500,000 of 7 per cent cumulative prior lien stock to employees and customers, which was launched late in 1923, was brought to a successful close in March, 1924. About 70 per cent of the em-

COMPARATIVE INCOME STATEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE ELECTRIC RAILWAY
FOR THE YEARS 1916 TO 1924

	1916	1917	1918	1919	1920	1921	1922	1923	1924
Operating revenue	$1,157,191	$1,751,373	$2,899,975	$3,237,921	$4,193,669	$4,500,805	$5,007,951	$5,945,272	$6,198,987
Operating expenses	714,887	1,114,512	1,856,038	2,319,464	3,229,048	3,440,761	3,777,592	4,464,421	4,650,030
Net revenue—railway operation	442,304	636,861	1,043,937	918,457	964,621	1,060,044	1,230,359	1,480,851	1,548,957
Net auxiliary operating revenue	....	....	....	....	....	6,561	8,731	11,444	800
Net revenue from operation	442,304	636,861	1,043,937	918,457	964,621	1,066,605	1,239,090	1,492,295	1,549,757
Taxes assignable to railway operation	66,038	95,680	185,822	163,101	151,746	225,844	248,937	279,448	298,609
Operating income	376,266	541,181	858,115	755,356	812,875	840,761	990,153	1,212,847	1,251,148
Non-operating income	6,208	4,858	9,470	17,879	10,332	11,972	14,560	26,626	60,155
Gross income	382,474	546,039	867,585	773,235	823,207	852,733	1,004,713	1,239,473	1,311,303
Fixed charges	237,996	266,580	332,506	341,396	390,196	463,013	486,784	552,608	610,583
Net income	$144,478	$279,459	$535,079	$431,839	$433,011	$389,720	$517,929	$686,865	$700,720

ployees subscribed for this stock. The balance was sold largely to small investors, customers of the company living in the various communities served by the railroad.

A second issue of $1,000,000 of the same stock was placed on the market in November, 1924, the employees again acting as salesmen and saleswomen. The second issue proved even more popular than the first and the entire issue was considerably oversubscribed in less than three months after the sale opened.

The wide distribution given this stock is shown by the fact that on the day the sale closed officially the subscribers numbered 2,652, of whom 1,489, or 54 per cent, paid cash and 1,163, or 46 per cent, were paying on the monthly installment plan. Stockholders of the company now number 4,768, while subscribers who are paying on the installment plan bring the total to upward of 6,250. The average subscription for prior lien stock is four shares to a subscriber. The company looks upon this wide distribution of stock among the patrons of the line as an important factor in creating good public relations.

Construction work on the new Valley Line, which runs from a junction with the tracks of the Chicago Rapid Transit Company at Howard Street, Chicago, west in the cities of Evanston and Niles Center, and north through the Skokie Valley to a connection with the Libertyville Branch, near Lake Bluff, was commenced early in the spring and pushed toward completion. At the time the report was prepared the line had been completed to Dempster Street in Niles Center, a distance of 5 miles of double track. The first train carrying passengers was run over the line on Feb. 1, from Howard Street to Dempster Street. It has since been opened for traffic.

The program of stone ballasting on the main line was carried on throughout the year. Thirteen miles of right-of-way was inclosed with wire fencing. Automatic substations were built during the year at Berryville, Wis., and Winthrop Harbor, Ill. The following new equipment, part of which was purchased in 1923, was received:

Seven steel passenger coaches, two steel parlor observation cars, one steel dining car, thirteen motor coaches, 29-passenger capacity; one parlor motor coach, two intercity type motor coaches, ten merchandise despatch cars, one Champion snow plow, one reinforced concrete gondola car, one motor derrick car, one single-truck snow sweeper and one steel sub-frame flat car.

A new motor coach route was opened in June between Waukegan and Volo, and in July the route was extended to McHenry. Another route was opened between Waukegan and Antioch.

The educational department is doing a great deal for the morale of the working forces. Classes in English, for foreign-born track laborers; in public speaking, electricity, operation of air brakes and similar subjects were conducted regularly throughout the year, and several educational and social clubs were organized. Private instruction in arithmetic, mechanical drawing, etc., was provided for those who were unable to attend the regular classes. More advanced students were assisted to continue their education in evening classes in various colleges. Employees of the company are now attending seventeen outside educational institutions.

The record shows a reduction of 14 per cent in the number of accidents over the previous year. In accidents to employees, the record shows a reduction of 29 per cent in days of lost time.

A total of 205 safety meetings of employees were held, at which papers on various phases of operation were read by motormen, conductors, shop mechanics, etc. Under the direction of the company's safety engineer and with the co-operation of the bureau of safety, every school in Racine, Kenosha, North Chicago and Highwood was visited and talks on safety made to the pupils. A number of schools in Milwaukee also were visited, about 30,000 school children being reached in this way. In addition, a number of talks on accident prevention were made before civic and parent-teachers' associations.

With the idea of still further improving public relations through employees, cash prizes were offered employees who submitted the best suggestions on how to improve the service, increase the business of the company, effect economies in operation, etc. A total of 810 suggestions were submitted, for which 115 cash prizes aggregating $600 were awarded.

Partial Abandonment Sought at Kingston

The Kingston Consolidated Railroad Company, Kingston, N. Y., on April 22 petitioned the Public Service Commission for permission to abandon all of the route of the former Colonial City Traction Company except that portion along the Strand to Kingston Point. The route of the former Kingston City Railroad, which was merged with the Colonial company in 1901, will be operated without any change, if the petition is approved.

The petition claims that for nearly the entire distance the lines of the Colonial company and the former Kingston City company are so near together that the lines of the Kingston City company are equally convenient for most travelers. It is proposed, however, to establish bus routes to parts of the city not now served by either line. For this purpose the Kingston City Transportation Company has been organized and an application is pending before the Council for approval of such routes.

It is alleged in the petition that for many years the company's revenues have been insufficient to afford an adequate return on the value of its property and that while the Kingston City company lines have paid, the Colonial lines have returned deficits. Last year the deficit on these lines was $15,835. Various rates of fare have been tried without obtaining the desired relief, it was said. The present fare is 8 cents.

Railway Operating Revenues in Milwaukee Well Maintained

The operating revenue of the railway department of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., was $10,390,127 in 1924, representing a decrease of 1.60 per cent compared with 1923. This fact was disclosed in the annual report to the stockholders. For maintenance and depreciation of physical property the percentage of operating revenues for the railway department was 22.22 per cent.

Of the $4,595,074 net capital expenditures for additions to and betterment of property during the year, after deducting replacements and property withdrawn from service, $873,058 was used in the railway utility. The expenditures in the railway utility included principally the construction of 2.7 miles of new track in the city of Milwaukee, betterment of approximately 11 miles of city track, including special work of heavier type to meet the heavier traffic conditions; rehabilitation of interurban lines to permit operation of high-speed passenger coaches, acquisition of additional land and buildings adjoining the company's Cold Spring shop and yard property, construction of utility repair building and addition to Hillside garage at the same location, interurban passenger waiting station and additional passenger and bus equipment.

Of the total authorized amount of $7,000,000 of 7 per cent preferred stock, there has been issued as at Dec. 31, 1924, and sold for cash at par $5,200,200 and $799,800 on the installment

INCOME ACCOUNT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY FOR THE YEAR 1924

Operating revenues	....	$22,559,912
Operating expenses:		
Ordinary operating expenses	$14,169,176	
Depreciation (reserve credit)	1,627,102	
Taxes	1,757,306	
Total operating expenses	....	$17,553,585
Net operating revenues	....	$5,006,327
Non-operating revenues	....	252,884
Gross income	....	$5,259,211
Interest charges:		
Interest on funded and unfunded debt	$2,454,117	
Interest on depreciation reserve balances	438,978	
Interest on other reserve balances	40,393	
Total interest charges	....	$2,933,489
Net income	....	$2,325,721

STATISTICAL DATA OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

	1924	1923
Miles of track owned	418.72	413.14
Miles of track leased	1.56	1.56
Miles of revenue track operated	391.08	388.99
Revenue passengers carried	150,857,684	153,626,868
Transfer passengers carried	52,306,065	54,238,201
Per cent transfer to revenue passengers	34.67	35.31
Receipts per revenue passenger	$0.0664	$0.0664
Number of passenger cars owned	870	850
Number of passenger buses owned	107	93

plan, on which partial payments had not been completed. No sales have as yet been made of the stock authorized by the directors under date of Nov. 24, 1924. The company now has approximately 11,500 holders of its preferred stock exclusive of subscribers who have not completed installment payments.

With the exception of the $1,000,000 of additional 7 per cent preferred stock authorized Nov. 24, 1924, the company did no financing during the year. Its cash requirements for construction purposes were obtained principally from the sale of securities heretofore authorized.

In his annual report to the stockholders, John I. Beggs, president, says that the business as a whole during the year was not as favorable as anticipated. The slowing down in industrial activity which occurred in the late spring and continued through the summer months, combined with abnormal weather conditions, had a depressing effect, particularly on the company's railway business. During the latter months of the year there were signs of improvement and indications for the new year are for greater industrial activity.

Suspension Affects Akron Company's Income

The net income of the Northern Ohio Traction & Light Company, Akron, Ohio, in 1924 was less than in the preceding year. This unfavorable showing was due largely to the 27 days suspension of railway service in Akron following the expiration of the local franchise on Feb. 1 and to the generally unsatisfactory rates of fare that were in effect during the greater part of the year. The management succeeded in obtaining increased fares between certain interurban points and increased fares were granted in Akron when the new franchise became effective on Nov. 12. The effect of these increases naturally was not noticeable to any appreciable extent in the 1924 earnings, but should be reflected in the 1925 earnings.

The electric railway lines carried fewer revenue passengers last year than in 1923. This loss is largely accounted for by the suspension of railway service in Akron (the principal city served), from Feb. 1 to 27, 1924, during which time riding on the interurban division also was affected. Comparative figures showing passengers carried for the five years ended Dec. 31, 1924, are shown in the following tabulation:

	Revenue Passengers Carried Rail and Buses	
	City Systems	Interurban Systems
1920	68,903,885	20,876,115
1921	47,799,437	16,820,442
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,588,525

STATEMENT OF EARNINGS OF NORTHERN OHIO TRACTION & LIGHT COMPANY

Gross earnings:	1924	1923
Railway department	$5,364,189	$5,849,877
Electric department	4,716,808	4,255,247
Total	$10,080,997	$10,105,124
Operating expenses and taxes:		
Operating expenses	$7,161,533	$6,986,196
Taxes	741,900	779,400
Total	$7,903,433	$7,765,596
Gross income	$2,177,563	$2,339,528
Interest and other fixed charges	1,441,966	1,310,533
Net income available for dividends and depreciation	$735,596	$1,028,995
Dividends on preferred stock	431,750	412,360
Balance	$303,846	$616,634
Ratio of operating expenses to gross earnings	71.04%	69.14%
Ratio of operating expenses and taxes to gross earings	78.40%	76.85%

SUMMARY OF SURPLUS ACCOUNT NORTHERN OHIO TRACTION & LIGHT COMPANY

Surplus—Jan. 1, 1924		$393,260
Net income available for depreciation and dividends, year ended Dec. 31, 1924		735,596
		$1,128,857
Deduct:		
Appropriation for depreciation	$100,000	
Dividends on preferred stock	431,750	
Dividends on common stock	150,000	681,750
		$447,106
Deduct sundry surplus adjustments		2,031
Surplus—Dec. 31, 1924		$445,074

The report states that the company was among the first of its kind to recognize the desirability of buses to supplement urban and interurban transportation service rendered by electric railways. Equipment of this character was added to the transportation system from time to time until on Dec. 31, 1924, the company had 76 buses in operation in conjunction with its city railway service and 35 coaches in conjunction with its interurban service. Steps have been taken further to round out the company's city and interurban transportation system by the purchase of additional buses and coaches and every effort will be made by the management to continue furnishing a high class co-ordinated rail and bus service.

Reference was made in the previous annual report to the suspension of street railway service in Akron on Feb. 1, 1924, when the franchise expired and the basis upon which operations were resumed. A new franchise subsequently was drawn and, upon submission to the voters at the general election on Nov. 4 last, it was approved by a satisfactory majority. The franchise provides for a co-ordinated street railway motor bus

Conspectus of Indexes for April, 1925

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares*† 1913 = 4.84	Apr. 1925 **7.26**	Mar. 1925 **7.26**	Apr. 1924 **6.94**	Apr. 1925 **7.26**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	Apr. 1925 **157.3**	Mar. 1925 **158.4**	Apr. 1924 **162.8**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Apr. 1925 **221.6**	Mar. 1925 **221.5**	Apr. 1924 **217.7**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Mar. 31 1925 **4.86**	Feb. 28 1925 **5.28**	Mar. 31 1924 **4.78**	July 31 1920 **11.12**	July 31 1924 **3.19**
U. S. Bank Clearings Outside N. Y. City (Billions)	Mar. 1925 **17.76**	Feb. 1925 **15.67**	Mar. 1924 **16.20**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures	Mar. 1925	Feb. 1925	Mar. 1924	Jan. 1924	Sept. 1924
Number	**1631**	**1651**	**1657**	**2231**	**1277**
Liabilities (Millions)	**35.14**	**41.17**	**64.95**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	Apr. 1925 **209.6**	Mar. 1925 **210.2**	Apr. 1924 **221.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Mar. 1925 **161.0**	Feb. 1925 **160.6**	Mar. 1924 **149.9**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Apr. 1 1925 **13.69**	Mar. 1 1925 **13.84**	Apr. 1 1924 **12.66**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Apr. 1 1925 **194.5**	Mar. 1 1925 **201.9**	Apr. 1 1924 **186.8**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Mar. 1925 **151**	Feb. 1925 **151**	Mar. 1924 **144**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd Cost of living 1914 = 100	Mar. 1925 **165.3**	Feb. 1925 **165.3**	Mar. 1924 **163.2**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

transportation service. It was accepted by the company on Nov. 12, 1924, when it became effective, and will expire four years from that date. It was not deemed advisable either by the public authorities or the management at the time to enter into a long-term franchise containing fixed rates of fare as the next four years are expected to furnish a more reliable guide to future normal prices and means of modern urban and interurban transportation. New rates of fare were established, viz.: 7 cents for single fares, four tickets for 25 cents and seventeen tickets for $1, with free transfer privilege between city street cars and motor buses. These rates compare with a straight 5-cent fare, transfers free, in effect up to Feb. 1, 1924, and a 5-cent fare with 1 cent additional for transfers, in effect from Feb. 28 to Nov. 12, 1924. Provision was made for the elimination of "jitney" and bus competition on streets where the company furnished transportation service, and for the extension of new bus routes under direction of the City Council and by agreement with the company.

First Key System Report

$308,207 Balance to Surplus as Result of First Year of Operation Since Reorganization

The first annual report of the Key System Transit Company, Oakland, Cal., shows that during 1924 the company earned $6.50 on its second preferred stock before federal taxes. The statement covers the full calendar year, the books of the new company having been opened as of Jan. 1, 1924, under the direction of and in accordance with the rules of the Interstate Commerce Commission. There is an explanation of why the franchise amendment recently proposed by the city of Oakland could not be accepted by the company.

During the year, the report shows, the company provided additional service to the extent of 398,382 passenger car-miles, 233,715 bus-miles and 403 ferryboat-miles and transported 2,211,202 additional passengers, as compared with 1923. This additional service cost $226,000, while the increased passenger revenue was only $96,000.

The additional facilities furnished by the company at a net loss of $130,000 were started, the report points out, through desire of the company to improve its service to the people of the East Bay district and with a hope that in a reasonable time the number of patrons would increase sufficiently to pay for the increased cost of service. The operation of the bus service, started during the year on a 6-cent fare with free transfer privileges, is being conducted at an annual loss of approximately $75,000. C. O. G. Miller, president, remarks:

> From the standpoint of the bondholders of the company the earnings for the year are satisfactory. From the standpoint of the stockholders the earnings are inadequate and unsatisfactory. But electric tractions are gaining their place among securities favored by wise and careful investors.
>
> An eminent financial writer recently attributed the revival of the electric railway industry to a number of factors, the most important of which are the abandonment of the rigid 5-cent fare, sane and constructive public regulation, relief from unreasonable taxation and other exactions, which had become obsolete, and finally the force of progressive brain power in management and operation.
>
> There is a place for the gasoline-propelled, rubber-tired vehicle, but not where there is heavy traffic and long hauls. For the greatest convenience and economy the gasoline vehicle should be used in supplementary and feeder service.
>
> This opinion has been verified by the experience of the company during the past year.

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1924

Gross operating revenue		$7,306,574
Operating expenses:		
Way and structures (maintenance)	$467,360	
Equipment (maintenance)	474,785	
Power (maintenance and operation)	691,937	
Conducting transportation	2,776,092	
Traffic expenses	23,607	
General and miscellaneous expenses	636,082	
Transportation for investment and construction overhead (credit)	57,102	$5,012,763
Net operation revenue		$2,293,810
Add net revenue commissary department		142,310
Total net revenue		$2,436,121
*Less taxes		465,975
Operating income		$1,970,146
Add non-operating income		134,059
Gross profit		$2,104,205
Sundry charges:		
Depreciation	$650,960	
Amortization of franchises	8,762	
Abandonment of obsolete equipment	220	659,942
Balance—Current operations		$1,444,263
Deductions:		
Bond interest	$760,781	
Other interest	39,762	
Miscellaneous	22,192	822,736
Surplus—Current operations		$621,526
Profit and loss adjustments		4,984
Surplus		$616,541
Less three quarterly prior preferred dividends paid		308,334
Balance to surplus account		$308,207

* Includes estimated federal income tax for year 1924.

MISCELLANEOUS STATISTICS OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1924

Passengers Carried:		
Traction Division:		
Cash and ticket fares—6 cents		73,128,336
School tickets—3 cents		1,824,737
Commuters (East Bay cities)		686,831
Miscellaneous—12 cents, 18 cents, etc		1,279,972
Total revenue passengers		76,919,876
Free transfer passengers		20,802,481
Total revenue and transfer passengers		97,722,357
Key Division:		
18 cents Transbay fares	8,929,072	
Commuters—Transbay	8,155,118	
10-cent school children	221,606	
San Francisco-Sacramento Railroad tickets	251,580	
Miscellaneous Transbay tickets	21,830	
Total Transbay passengers		17,579,206
6-cent fares (East Bay cities)	517,441	
School tickets, 3 cents	46,726	
Total passengers (East Bay cities)		564,167
Total revenue passengers—Key Division		18,143,373
Entire system:		
Revenue passengers		95,063,249
Revenue and free transfer passengers		115,865,730
Average fare, revenue and transfer passengers, Traction Division		4.80c
Average fare, revenue pasengers, Transbay		14.03c
Average number of passengers per day, Traction Division		267,001
Average number of passengers per day, Transbay		48,031
Car Mileage:		
Passenger car mileage	17,826,919	
Freight car mileage	30,725	17,857,644
Car-Hours:		
Passenger car-hours	1,769,515	
Freight car-hours	6,644	1,776,159
Ferryboat mileage		113,728
Motor coach mileage (last quarter of the year)		170,970
Total miles of track operated		266.68

Georgia Interurban Has Net of $12,118 Before Charges

The Atlanta Northern Railway, operating between Atlanta and Marietta, Ga., has reported to the Georgia Public Service Commission net earnings of $12,118 for the year 1924, without making any deductions for interest or other capital charges. Revenue for the year was $247,659, while expenses were $235,540, not including interest on bonds and other charges.

The Atlanta Northern Railway figured prominently in the news some months ago when it suspended operations because of unfair bus competition, tore out a section of track and refused to resume service between Atlanta and Marietta until definite action was taken by the city of Marietta barring jitneys and buses from direct competition with the interurban line. The road won its fight.

Railway Earnings Lower in Springfield, Ill.

For the year ended Dec. 31, 1924, the Illinois Power Company, Springfield, Ill., reports gross earnings from railway operation of $691,386, compared with $711,270 for the year ended Dec. 31, 1923. The number of revenue passengers carried in 1924 was 10,661,451, against 11,150,971 in 1923.

The expenditures made in the railway department during 1924 were largely in connection with the street improvement program which the company undertook when its electric and heating franchises were renewed in August, 1921. The work has been carried on in conjunction with the city's general improvement program. The company's proportion is near completion and expenditures of this character should be substantially less after 1925. Expenditures were also made for equipping seven double-truck cars with standard safety devices so they may be used for one-man operation. In addition the company purchased five 25-passenger buses for operation in connection with street railway service.

The early expiration date (July, 1928) of the franchise under which the company was operated prior to 1924 had hampered the management in financing construction, but a new franchise was granted by the voters at an election held Nov. 4 last. It runs for twenty years.

During the year the Illinois Power Company started a modern bus service in the southeastern and northwestern sections of Springfield. These sections were not heretofore served by street car lines. Free transfers were issued between the street cars and the buses and the extension of the transportation system in this matter has met with the approval of the public.

Charges Against Northern Ohio Denied

B. C. Cobb, president of the Northern Ohio Traction & Light Company, Akron, Ohio, characterizes as without foundation charges contained in a petition filed at Akron on April 22 by counsel for Walter D. Foss, Wooster, Ohio, asking an accounting, an injunction and other protective measures. Mr. Cobb says the action is not well founded and that it would be difficult to conceive of the preferred stockholders in any number joining in the suit, as the things complained of have been for the benefit of all the stockholders and the properties. The case, he added, will be contested to the limit. Mr. Cobb said:

> The dividends to the preferred stock holders have been paid regularly out of earnings and the reference to the contract contained in the suit relates to the supervision and engineering services, whereby the Northern Ohio Electric Corporation rendered engineering, supervisory and general services in line with the economies of unified operation. Dividends on the common stock have, of course, been paid only out of earnings.

The petition filed in behalf of Mr. Foss names Hodenpyl, Hardy & Company and the Northern Ohio Traction & Light Company, the Northern Ohio Electric Corporation and the Northern Ohio Power Company, organized early this year to take over the assets of the electric corporation. He asserts among other things that the dividends on the common stock, omitted only in 1922, were paid out of capital. He further contends that all payments to the electric corporation, amounting to $3,658,931, were illegal and asks that they be returned; that the agreement relative to engineering and supervisory services entered into between the Northern Ohio Traction & Light Company and the electric corporation be annulled and that officials of the traction company be restrained from making further payments to the holding company; that no more dividends be declared on the common stock and that common stock be not transferred during the litigation.

Surplus in Toledo in March

Operations of the Community Traction Company, Toledo, Ohio, for the month of March reported to the board of street railway control at its monthly meeting by Commissioner E. L. Graumlich showed a net surplus of $6,249 to be added to the stabilizing fund, making the total deficit in that fund now $530,525. Gross revenue in March was $325,511 as compared with $375,407 for the similar month in 1924. Total operating charges, however, in March were $225,519 as compared with $279,989 for the similar month last year.

There were carried in March 4,406,220 revenue passengers as compared with 5,415,974 for the same month last year. There was a decrease in car mileage to correspond with the drop in patronage, and with the effect of higher fare, use of one-man cars and lower power rates the result this year was much better.

Net earnings from operations were 25.591 cents per car mile as compared with 21.153 cents per car mile last year.

Of revenue passengers 62.9 per cent were using tokens selling at three for 25 cents and only 13.1 per cent paid the straight 10-cent cash fare.

New York City Receivership to Be Lifted May 1

May 1 will witness the lifting of the receivership of the New York Railways, New York City. Announcement to this effect was made on April 24 by Joseph P. Cotton, speaking for the reorganization committee. The property which will emerge from receivership includes more than 75 miles of line. It embraces the Broadway-Seventh Avenue, the Lexington Avenue-Broadway, Sixth Avenue, Columbus-Lenox Avenues, Seventh Avenue, Spring-Delancey Streets, Eighth Street, Fourteenth Street, 23d Street, 34th Street, 116th Street routes.

Before the receivership these lines were controlled through stock ownership by the Interborough Rapid Transit Company. That interest has been wiped out wholly and the lines revert to the bondholders and to property owners from whom the New York Railways held leases. After prolonged controversies and litigation, these interests have been largely harmonized in the new concern, the New York Railways Corporation. As indicated previously in the ELECTRIC RAILWAY JOURNAL, the capitalization under the reorganization is reduced from $91,366,445 to $40,163,622. By the abolition of various leases and a complete reorganization of the financial structure of the system, the annual fixed charges have been cut from $2,098,059 to $967,500.

In a statement which he made Mr. Cotton said:

> The lines are able to pay their way largely because of the drastic elimination of fixed charges, but there have been many other economies. The sale of the 50th Street carhouse has enabled us to escape from the heavy taxes and costs of operation there. The abandonment of losing lines, downtown especially, has reduced the property and effected a saving. There have been many other economies. The one-man cars have been the least of these.
>
> The great problem that we face today is the increasing congestion on the streets, but the police are giving us good co-operation, and it is astonishing how rapidly the surface cars get along after all.

The successor company will be headed by Hugh J. Sheeran as president. Mr. Sheeran was operating head of the road under the receivership of the late Job E. Hedges and succeeded Mr. Hedges as receiver.

Purchase of Seattle & Rainier Line Being Discussed

Mayor Edwin J. Brown and eight of the nine members of the City Council of Seattle, Wash., are in favor of purchasing the Seattle & Rainier Valley Railway system, if a fair price can be agreed upon. The Rainier Valley system extends from Fourth Avenue and Stewart Street, through Rainier Valley, and along the west and south shores of Lake Washington to Renton, a distance of approximately 12 miles. It has been appraised at $1,045,547 by the city department of public utilities.

The company has 112,502 ft. of track, or approximately 21 miles. In 1923 the value of the system for rate-making purposes was fixed by the State Department of Public Works at $1,503,788. In the city's compilation, no allowance has been made for franchise values, engineering, legal or general expense, interest during construction discounts or commission, except that an allowance of 5 per cent has been made for engineering and superintendence on the tracks and overhead.

Walter M. Brown, general manager of the Seattle & Rainier Valley line, indicated that the sum set by the city would not be acceptable to the company. He states that in 1922 a valuation report by the State Department of Public Works showed a total value of more than $1,600,000. This figure was based only on such parts of the company's system as are used or useful in its business, and did not include real estate and other property not necessary to the railway operation that would be transferred to the city if a purchase is arranged. Outstanding obligations, including three issues of bonds, aggregate $1,600,000.

About 3 miles of railway are outside the city limits. Under a recent state law, the city has power to maintain and operate a railway 3 miles outside its limits.

Jamaica Railway Receipts Higher

Improved methods of fare collection resulted in a marked increase in the tramway earnings of the Jamaica Public Service Company, Ltd., Kingston, Jamaica, during a period in 1924, when the number of passengers decreased because of a general depression in business and a long drought. Service was improved and there were fewer interruptions. The receipts of the railway department exceeded all previous records and were 8 per cent higher than in 1923. They amounted to approximately 64 per cent of the entire income of the company. Four nine-bench open tram cars were constructed in the company's shops. These cars supply a need for additional equipment to meet the demand for service, particularly during the hours of heavy travel.

The shares of the company are widely distributed and are held by 436 shareholders. Of this number 410 live in the Dominion of Canada, fourteen in the United States, one in England, one in Japan, and one in Mexico. There are no shareholders in Jamaica, but the directors have authorized the sale locally of 7 per cent cumulative preference shares "B" in sterling form, the proceeds of which will be utilized for additional improvements to the company's property.

Hearing on Discontinuance Set.—The Indiana Public Service Commission has set April 28 as the date for a hearing at Indianapolis on the petition of the Union Traction Company to discontinue operation of the Anderson-Middletown line.

Increase in Net Income.—For the nine-month period ended March 31, 1925, the total operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., were $32,085,954, against $29,463,304 for a similar period in 1924. The operating expenses increased from $19,711,512 to

$21,081,851 in 1925. The net income advanced from $2,616,208 for the nine-month period ended March 31, 1924, to $3,658,547 for the nine-month period ended March 31, 1925.

Common Stock Issue Approved.—The San Diego Electric Railway, San Diego, Cal., has been authorized by the Railroad Commission to issue and sell at not less than par, on or before Oct. 1, 1925, $2,948,000 par value of its common capital stock and to use the proceeds to acquire a similar amount of outstanding first mortgage 5 per cent bonds, or to exchange the same with the Oceanic Steamship Company, holder of said bonds.

Corporate Income Falls Off.—The passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., for the nine months ended March 31, 1925, was $8,458,238 against $8,750,449 for a similar period of last year. The operating expenses and taxes increased, being $7,183,265 for the 1924 period and $7,309,570 for the nine-month period of the present year. The net corporate income fell off. For the nine-month period in 1924 it was $1,479,829 and for the nine-month period ended March 31, 1925, it was $1,083,513.

Improvement in Net Income.—For the first two months of the present year the revenue and income of the Eastern Massachusetts Street Railway, Boston, Mass., was $1,679,378, against $1,720,643 for the similar period of 1924. The expenses and taxes fell from $1,350,292 for the two months of 1924 to $1,295,141 in 1925. Net income, however, showed an increase. It was $141,636 for January-February 1924 and $165,934 for the two months period ended February, 1925.

Preferred Stock Offered.—W. C. Langley & Company, New York, are offering at 95 and accrued dividend to yield 7.36 per cent $1,000,000 of the Iowa Southern Utilities Company 7 per cent cumulative preferred stock. The company operates an electric railway connecting Centerville, Mystic and Albia in Iowa and the local railway in Burlington. The purpose of the issue will be to apply the preferred stock to the retirement of an equal principal amount of notes.

Seeks to Abandon on State Street.—The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission for permission to abandon service on its line upon State Street between Broadway and E Street and to take up its tracks. The company desires to operate a bus service in lieu of car service over this abandoned portion.

Deficit for Nine Months.—For the nine-month period ended March 31, 1925, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., was $43,811,225, representing an increase of $590,879 over a similar period ended March 31, 1924. The operating expenses, taxes and rental paid the city for the old subway amounted to $29,028,299, or a decrease of $302,143 over a similar period a year ago. The balance, after actual maintenance, showed a deficit of $129,193, or an increase over the nine-month period ended March 31, 1924, of $702,888.

Car Trust Bonds Offered.—The Union Trust Company, Pittsburgh, Pa., is offering at prices ranging from 101 and interest to 101½ and interest, to yield from 4.95 per cent to 4.85 per cent, according to maturity, $1,200,000 of 6 per cent car trust gold bonds, series B, of the Pittsburgh Railways. The bonds are to be issued in part payment for 103 new standard semi-steel passenger street cars, the cost of which will be more than $1,505,000, or 25 per cent in excess of the full amount of these bonds. The title to the equipment is to be vested in the trustee under lease to the company at a rental sufficient to pay these bonds and the interest and other charges as they become due. Following is a description of the cars: twenty semi-steel, single-end, center-entrance, low-floor, double-truck, multiple-unit interurban cars; 83 semi-steel, single-end, center-entrance, low-floor, double-truck, multiple-unit city cars.

Railway Properties Suffered in 1924.—In its annual report for 1924 the Dominion Power & Transmission Company, Ltd., Hamilton, Canada, states that its railway properties felt the depression of the year 1924 more severely than other branches of the business. This result was partly due to the various forms of automobile travel, particularly increased use of the private car. In common with business of nearly all kinds the company, according to President Moodie, had a disappointing year. The Dominion Power & Transmission Company controls and operates the Hamilton & Dundas Street Railway, the Hamilton Radial Electric Railway, the Hamilton, Grimsby & Beamsville Electric Railway and the Brantford & Hamilton Electric Railway.

Surplus, $9,689.—For the year ended Dec. 31, 1924, the total income of the California Railway & Power Company was $33,092. This fact was disclosed in the twelfth annual report to the stockholders. The California Railway & Power Company owns all the stock of the San Francisco Electric Railways and a substantial amount of the stock of the Market Street Railway. The total expenses for the year were $15,052, with a net income of $18,040. There was a deficit at the beginning of the year of $8,351 and a surplus Dec. 31, 1924, per balance sheet of $9,689. The report contains the income and profit and loss statement as well as the balance sheets of the California Railway & Power Company and the Market Street Railway.

Utilities Report Submitted.—The valuation of the Los Angeles Railway, Los Angeles, Cal., is practically completed. The valuation of the Pacific Electric Railway is approximately 50 per cent finished. From all indications the joint report will not be ready before Jan. 1, 1925. These statements were made in the fifteenth annual report of the Board of Public Utilities of the city of Los Angeles for the period from July 1, 1923, to June 30, 1924, submitted to the Mayor and City Council. In addition to comment on the unification survey the report discusses railway extensions made during the past year in Los Angeles, the subject of power shortage and the matter of crossing protection and elimination. In addition a comparative table of electric railway transportation rates in various cities for the year 1923-1924 is given. A section of the report deals with motor vehicle transportation. It estimates the increase in number of drivers in 1924 over 1923 and in the number of vehicles used in this method of transportation. The report states that no legislation of importance affecting the powers and duties of the Board of Public Utilities was enacted during the fiscal year covered by the report.

Seeks to Abandon a Line in Fredonia.—The Buffalo & Erie Railway, which operates between Buffalo, N. Y., and Erie, Pa., has applied to the Public Service Commission for permission to abandon its local line in East Main Street, Fredonia. The company says this short local line does not pay operating expenses. The company has increased its service between Fredonia and Dunkirk, giving a twelve-minute schedule instead of fifteen minutes. A revised interurban service west of Fredonia also went into effect on April 15.

Crape for Last Trip.—The Kentucky Utilities Company, Somerset, Ky., discontinued service on April 3. The City Council released the company from further operation, its franchise having only until Aug. 1 to run. The company paid the city $2,500 to remove rails and ties. On their last trips the two street cars carried huge bows of black crape at both the front and rear ends. Somerset is a city of 5,000 population. The railway consisted of 3.3 miles of track.

Bus Line Price $200,000.—After a hearing before the Maryland Public Service Commission, the Baltimore Transit Company, a subsidiary of the United Railways & Electric Company, took over the ownership and operation of the East Fayette Street Bus Company. The price agreed upon was $200,000. The Baltimore Transit Company plans to improve the service of the line. In a balance sheet of Feb. 25, 1925, the East Fayette Street Bus Company listed assets under book value as garage, land and building, $20,000; buses and equipment, $143,568; gasoline tanks, $1,845; office fixtures, $728, totaling $166,141. Additional assets listed were good will and franchise, $46,500; cash, $5,534; discount on capital stock, $8,000; prepaid licenses, $5,812; unexpired insurance premiums, $428. The total assets were given as $233,401. Other details of this bus sale were given in the ELECTRIC RAILWAY JOURNAL, issue of March 21, page 488.

Deficit in February.—Deficit of the Youngstown Municipal Railway, Youngstown, Ohio, in February was $7,477, according to Traction Commissioner Engle. The February deficit followed two months in which the railway showed the first profits since the service-at-cost franchise became effective. The report showed gross revenue of $169,658 and total actual cost of operation of $177,135. Of the total earnings $127,924 was from railways and the balance from buses. Cars and buses during the month carried 2,783,069 passengers over a distance of 445,644 miles. The total deficit in the stabilizing fund is now $1,242,422.

Personal Items

Adrian Hughes, Jr., in Operating Post

Baltimore Official to Represent Mr. Palmer in Bus Affairs—Mr. Wennagel Has Added Responsibility

Adrian Hughes, Jr., superintendent of power of the United Railways & Electric Company, Baltimore, Md., has been made superintendent of bus transportation in direct charge of the operation and maintenance of all of the company's bus lines. George F. Wennagel, assistant superintendent of power, will have direct charge of the power department, but Mr. Hughes will retain general supervision of the department in a consulting capacity.

The appointment of Mr. Hughes to have general supervision of bus operation was occasioned by the broadening and enlarging of the company's bus activities. As an additional officer in that department Mr. Hughes will relieve L. H. Palmer, vice-president and general manager of the company, of some of the details of the bus work and at the same time give the bus operations technical supervision. W. E. Martin, superintendent of the Baltimore Transit Company, the bus operating subsidiary, continues with the company. His status, it is understood, remains unchanged, except that Mr. Hughes will represent Mr. Palmer direct. Mr. Martin is not an engineer.

Adrian Hughes, Jr.

Mr. Hughes has been connected with the company at Baltimore since 1914. He entered its employ as an engineer in the distribution division of the power department, and in August, 1918, was made assistant to the superintendent of power in charge of the power stations. Not quite two years later, on May 1, 1920, he was made superintendent of power. Mr. Hughes began his professional career with the electrical department of the Edgar Thomson Steel Mill of the Carnegie Steel Company at Pittsburgh in July, 1912, where he had worked during several summer vacations. In November, 1912, he was made general foreman of the electrical department of the works and went from the works to the railway. He was born in Baltimore, was graduated from Rock Hill College, Maryland, in 1908 with an A.B. degree and from Cornell in 1912 in electrical engineering.

Mr. Wennagel entered the service of the railway in December, 1906, in the lines and cables division of the power department. Six years later he left the railway to become assistant engineer with the electrical commission of Baltimore and remained in that position until Dec. 31, 1917. He then re-entered the service of the railway as an engineer in the power department, and subsequently was appointed assistant superintendent of power. Mr. Wennagel was born in Baltimore, on Jan. 14, 1887. He was graduated from the Baltimore Polytechnic Institute in 1906. For a number of years thereafter he served as instructor in mathematics and electricity at one of the local evening technical schools. In 1906 he went with the Chesapeake & Potomac Telephone Company of Baltimore, working for that company about three months in the office of the plant engineer. He resigned from the telephone company to take a position as inspector of construction work with the Electric Commission of Baltimore.

E. A. West Appointed to Salt Lake

Edward A. West, general superintendent of the Denver Tramway, Denver, Col., with which he has been connected for the last nine years, will succeed Henry F. Dicke as general manager of the Utah Light & Traction Company, Salt Lake City, Utah. Prior to his appointment to the Denver Tramway Mr. West was on the executive staff of the Portland Railway, Light & Power Company, Portland, Ore., now the Portland Electric Power Company.

S. S. Crane Advanced

The recent purchase of the Altoona & Logan Valley Electric Railway, Altoona, Pa., by A. E. Fitkin & Company, New York, has been followed with the promotion of S. S. Crane, general manager, to operating vice-president in addition to general manager. In 1921 Mr. Crane celebrated his twenty-fifth anniversary with the Altoona & Logan Valley property. He began his business career as a train inspector for the Pennsylvania Railroad at Harrisburg. In 1892 he was made assistant trainmaster for the Pennsylvania at Altoona. Three years later he resigned to become general manager of the Altoona & Logan Valley Electric Railway. At one time he was in charge temporarily of the Johnstown Traction Company, Johnstown, N. Y. With the aid of Lee T. Shannon he rehabilitated that property, dividing his time between the Johnstown and Altoona properties.

Henry F. Dicke Goes to Allentown

Henry F. Dicke, for the past eight years general manager of the Utah Light & Traction Company, Salt Lake City, Utah, will, on May 1, become assistant to the president of the Lehigh Valley Transit Company, operating between Allentown and South Bethlehem, Pa.; vice-president of the East Penn Electric Company, Pottsville, and vice-president of the Williamsport Passenger Railway, Williamsport, Pa. His headquarters will be at Allentown.

Mr. Dicke is a native of Fort Wayne, Ind. In 1899 he entered the service of the Fort Wayne Traction Company in the accounting department, where he served for a period of five years. He resigned that position to become general auditor of the Ohio & Indiana Construction Company. This company was formed to build a 65-mile line from Fort Wayne to Lima, Ohio. During this construction work Mr. Dicke devoted some time to the engineering department and became superintendent of construction. When the work was completed he was placed in charge of operation of the property owned by the Fort Wayne, Van Wert & Lima Traction Company, which later, with several other properties, merged with the Ohio Electric Railway.

H. F. Dicke

For seven years he had charge of operation of the northern division of the Ohio Electric Railway, consisting of 242 miles of interurban lines, and then resigned to go to Boise, Idaho, as general manager of the Boise Valley Traction Company. He served in this capacity for five years, and was then made general manager of the Utah Light & Traction Company at Salt Lake City, which position he is now leaving to take up his duties with the Pennsylvania companies.

Edward T. Chapman, formerly secretary of the Connecticut Company, New Haven, Conn., has been elected to succeed the late Victor S. Curtis and will have the title of secretary-treasurer. Mr Chapman has been with the Connecticut Company since 1902, starting as local cashier at New Haven, Conn.

Messrs. Collins and Reichart Advanced

J. C. Collins has been appointed treasurer of the electric corporation and H. L. Reichart secretary and treasurer of the railways at Rochester, N. Y. Following this the financial offices of the Rochester Gas & Electric Corporation and the New York State Railways were transferred to Rochester from the New York City offices of the New York Central Railroad.

Mr. Reichart, formerly assistant secretary of both companies, becomes local secretary and treasurer of the New York State Railways. He will act for the railway's property and subsidiaries in Rochester, Syracuse and Utica and interurban lines. He fills the vacancy caused by the death of M. S. Bargar, formerly general treasurer of the New York Central, and all properties it controls. Mr. Reichart has been assistant secretary of the New York State Railways since 1913 and has been with the company since 1909.

Mr. Collins formerly served as secretary and assistant treasurer of both companies. He will have executive control of the financial affairs of the power concern.

Southern Pacific Announces Staff Changes

The executive offices of the Southern Pacific Company will be transferred from New York to San Francisco on May 31. The change involves the concentration in California of control, purchasing and contracting. The active jurisdiction of the president, William Sproule, will be extended to cover company operations in Texas and Louisiana. Paul Shoup, vice-president, will take charge of management and operation. Mr. Shoup is president of the Pacific Electric Railway and an officer of other electric railway properties controlled by the Southern Pacific.

W. B. Arnette is purchasing agent of the Nashville Railway & Light Company, Nashville, Tenn., succeeding the late H. B. Stubblefield.

Charles E. Dove has been made manager of the Dubuque Electric Company, Dubuque, Iowa. This position was formerly held by Thomas Parker.

L. E. Curry, for the past twelve years electrical engineer of the Michigan Electric Railroad, with headquarters at Jackson, Mich., recently resigned his position to become connected with the Drew Electric & Manufacturing Company at Cleveland, Ohio.

H. A. Siggins has succeeded the late D. H. Siggins as president of the Union Traction Company, Coffeyville, Kan. L. L. Francis, formerly electrical engineer, is now secretary and manager. L. C. Smith, who formerly had the title of secretary, is now treasurer, the title previously held by H. A. Siggins. Homer Hawkins is now master mechanic. He replaced O. L. Siggins in that capacity.

Mr. Vargas Executive Assistant

Comptroller of Key System Transit in New Post — Other Recent Key Appointments

Chester C. Vargas, comptroller of the Key System Transit Company, Oakland, Cal., and newly appointed assistant to the president of that company, entered the service of the Key System in July, 1912, as payroll extension clerk in the auditing department, at a salary of $35 a month. After occupying various positions in the auditing department he resigned as chief clerk in that department in July, 1918, to accept a position as auditor with the capital issues committee in Washington, D. C.

When this committee dissolved in December, 1918, Mr. Vargas accepted the position of disbursing officer for the War Risk Insurance. There he remained until July, 1920. He then returned to California as auditor for the Mercantile Trust Company.

In January, 1922, he returned to the Key System as comptroller, being made assistant to the president on March 16, 1925, in addition to retaining his duties as comptroller.

C. C. Vargas

Mr. Vargas was born on Dec. 25, 1892, in Lemoore, Kings County, Cal., and attended grammar and high schools in Nevada. Returning to California, he entered the University of California night school and took courses in accounting and in finance, and supplemented this work with studies in a business college, and by correspondence.

E. Floyd Smith, the new assistant manager of the bureau of public relations of the Key System Transit Company, entered the service of the company as a conductor in 1892. In 1901 he was made a clerk in the general offices and in 1903 was appointed cashier, in which position he has continued up to the present time.

Since the announcements were made by President C. O. G. Miller of the promotion of Mr. Vargas and Mr. Smith, H. P. Bell, electrical engineer, has been made chief engineer, reporting to the general manager; H. B. Murdock has been promoted to the position of civil engineer in charge of all mechanical matters with direct supervision over the maintenance of rolling stock and floating equipment, reporting to the chief engineer; and D. L. Babcock has been made engineer in charge of overhead lines, power and its sources, signals and other electrical operations, reporting to the chief engineer.

Obituary

E. J. Triay

Eduardo J. Triay, receiver of the Jacksonville Traction Company, Jacksonville, Fla., since October, 1920, died on April 3, 1925. In that post his work was conspicuous. He had no previous experience in electric railway work, but he did possess great executive ability.

The company at Jacksonville had been in bad shape financially for a long time before Mr. Triay took charge. He immediately made plans for its betterment with the result that today the company has very largely, if not quite, recovered the lost ground of the wartime period. Together with the local manager, J. P. Ingle, formerly an electric light commercial manager, Mr. Triay applied intensive merchandising methods. Largely through the efforts of Mr. Triay the company now has 75 per cent new equipment, including cars and parts.

Mr. Triay's death removes one of the few remaining pioneers of Jacksonville of more than 50 years ago. He always will be remembered as a man of fine character, of strong personality and great love and devotion to Jacksonville and to Florida. For many years he was a prominent figure in the politics of the state. A personal friend of the late Henry Morrison Flagler, owner and developer of the Florida East Coast Railway, Mr. Triay was for some years general agent of that property.

Mr. Triay was born in Cardenas, Cuba, on Aug. 16, 1852. He went to Jacksonville in 1870.

H. H. Lloyd

Harry H. Lloyd, purchasing agent for the Indianapolis Street Railway and the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., died on April 21. Mr. Lloyd entered traction service with the Rhode Island Company, now the United Electric Railways, Providence, R. I., as a stenographer in the office of Robert I. Todd, then the president of that company. When Mr. Todd became president of the Indianapolis Street Railway Company and the Terre Haute, Indianapolis & Eastern Traction Company in 1905, Mr. Lloyd went to Indianapolis with him. For a long time Mr. Lloyd was secretary to Mr. Todd. After filling this and other posts most acceptably he was appointed purchasing agent six years ago. At the time of his death Mr. Lloyd was chairman of the committee on purchases and stores of the American Electric Railway Association and a member of the committee on co-operation between manufacturers and electric railways. Mr. Lloyd was born in Manchester, England, 42 years ago.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

New Motors and Trucks to Replace Old Equipment

An order has been placed by the New York State Railways for 270 motors and trucks to replace old, obsolete equipment. Of these 204 will be used on the Rochester Division and 66 on the Utica Division. The motors will be General Electric, type 275-A, of 60 hp. capacity. The trucks will be Brill, type 39-E1. The new equipment when placed under cars will weigh complete from 35,000 to 37,000 lb. This is a saving in weight of from 15 to 20 per cent over the original equipment, which consisted of four motors per car. The new equipment provides only two motors per car. Wheel diameters have been reduced from 33 in. to 28 in. for driving wheels and 22 in. for pony wheels. Calculations indicate that the decrease in power and maintenance cost will pay for these equipments in four years. Delivery will start about June 1.

Belgian Concern to Manufacture Ingersoll-Rand Oil Engine

A connection of significance to the engineering world has lately been arranged between Carels Brothers of Ghent, Belgium, and the Ingersoll-Rand Company of New York City by which the Belgian concern will have the right to manufacture the well-known Ingersoll-Rand solid-injection type of oil engine.

Carels Brothers was organized in 1875 and has long enjoyed a prominent place in the industrial life of Belgium. Today, after successive periods of expansion, Carels Brothers is officially known as the Société d' Electricité et de Mécanique. Carels Brothers was among the first of the European licensees to work under the Diesel patents and Carels-Diesel engines have won wide recognition in many fields of service because of their excellence.

United States Prepares Industries' Statistics

The United States Department of Commerce is now preparing statistics for some 25 industries. Meantime, other industries are urging that the Department of Commerce do statistical work for them also, and there are no funds available. The question has arisen of the legality of the department to go ahead with the work and let the individual industries bear the cost thereof. The department, it is understood, feels that this statistical work could be better done by trade associations, but the question of legality has made many industries doubtful of performing on their own account this essential work, and makeshifts have to be employed pending further determination by the courts or Congress of the status of statistical trade information.

Will Experiment with Model Bus in Detroit

A model double-deck coach built on specifications drawn up by the Detroit Department of Street Railways, Detroit, Mich., has been delivered to the department by the Yellow Coach Manufacturing Company, Chicago. This model coach will be experimented with in forming a basis for recommendations for the purchase of a fleet of double-deck buses for service in Detroit. Last year the City Council refused to carry out the Street Railway Commission's recommendation relative to purchasing double-deck buses from the Chicago company. The coach just received for demonstration is built in accordance with the specifications of the D. S. R., which were outlined at that time and which the Detroit manufacturers recommended but some of the Councilmen did not agree to follow.

Requests for bids for buses to be purchased were withdrawn by the commission and the department began renting equipment from the Detroit Motorbus Company and purchasing single-deck buses from Dodge Brothers, Inc., Detroit manufacturer. At the present time the department reports that 83 buses are in operation, including eight rented from the Detroit Motorbus Company and 75 obtained from Dodge Brothers. Considerable mileage is already covered by motor coach routes in outlying sections of the city and connecting with street railway lines.

It is the intention of Ross Schram, general manager of the Detroit Street Railway, to use a fleet of double-deck buses when they are acquired by the city to supplement service on the main trunk lines. The type of bus which is now being demonstrated is fully inclosed, lighted and heated on both decks, with leather seats.

Six-wheel buses are being studied, and if it is decided by the D. S. R. that that feature is desirable it is believed that six wheels can be put on the coaches the D. S. R. buys at little additional expense. Electric-gasoline power plants are also being considered favorably by the D. S. R., although the new bus has a six-cylinder gasoline motor.

It has been announced by Mr. Schram that express stops by the street cars and local stops by the buses on the main trunk lines of the D. S. R. are contemplated. It is also planned that on some streets, where local conditions call for it, the coaches will make the express stops and the street cars the local stops. Only seated passengers would be carried on the buses and "Pullman" service would be supplied for those passengers who wish to pay the higher fare of 10 cents.

Changes in Westinghouse Railway Department

Two members of the railway sales department of the Westinghouse Electric & Manufacturing Company at East Pittsburgh have recently been transferred to field positions.

M. Kennedy, formerly section manager in the light traction division, is now in the transportation division of the Philadelphia office. Mr. Kennedy was graduated from Washington University, St. Louis, with a bachelor of science degree in electrical engineering. He enrolled with the Westinghouse Company in 1916 in the graduate student course. Following the completion of the student course he went to the substation section of the power department and thence to the International Company, with which he remained until 1920, when he transferred to the railway department in charge of light traction negotiation work for foreign fields. Later, Mr. Kennedy was appointed to the position he held at the time of his transfer. He served in the army during the war.

The other transfer is that of L. E. Lynde from the heavy traction division at East Pittsburgh to the transportation division of the New York office.

Immediately after he was graduated from the University of New Hampshire with a B. S. degree in electrical engineering Mr. Lynde entered the army, where he remained for two and a half years. Eighteen months of this time was spent in France and Germany.

In 1920 Mr. Lynde went to the Westinghouse Company, and after completing the graduate student course, went immediately to the heavy traction division. In that department he has been closely associated with all of the important steam railroad electrifications. Prior to his college days Mr. Lynde was employed by the Massachusetts Northeastern Railway during vacation periods.

Canadian Electrification Work Progressing

The electrification of the Grand Trunk Railway between Port Dalhousie and St. Catharines, Ont., Canada, is proceeding. This work is part of the plan of the Canadian National Railways to run fast electric trains from Port Dalhousie to Niagara Falls, Ont.

Metal, Coal and Material Prices

Metals—New York	April 21, 1925
Copper, electrolytic, cents per lb	13.337
Copper wire base, cents per lb	15.375
Lead, cents per lb	8.05
Zinc, cents per lb	6.85
Tin, Straits, cents per lb	52.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.30
Somerset mine run, Boston, net tons	2.025
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.50
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.06
White lead in oil (100-lb. keg), N. Y., cents per lb	0.157
Turpentine (bbl. lots), N. Y., per gal	0 99

Rolling Stock

Altoona & Logan Valley Electric Railway, Altoona, Pa., will spend $175,000 for the purchase of new trolley cars, ten of the 48-passenger type and five of the 24-passenger one-man type.

Madison Railways, Madison, Wis., has purchased two additional buses for relief or charter service.

New Brunswick Power Company, St. John, N. B., is constructing at its own shops in St. John two new cars of the one-man type. These are the first cars other than sweepers and work cars to be constructed in the company's shops. Besides the two new cars, one of the old cars has been remodeled.

Key West Electric Company, Key West, Fla., will operate four Mack 230½-in. bus chassis recently ordered by Stone & Webster. These chassis will be mounted with special 29-passenger city-type bodies built by the American Car Company, St. Louis.

Alabama Power Company, Montgomery, Ala., bought five cars from the defunct Selma Electric Railway for use in the Montgomery division.

Track and Line

Wisconsin Power & Light Company, Oshkosh, Wis., has completed plans for the addition of about 1¼ miles of single track to its railway in Sheboygan.

Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has appropriated $200,000 for the equipment of the extension of the Fourth Avenue subway from 86th Street to 95th Street, Brooklyn.

Municipal Railway, San Francisco, Cal., has awarded a contract for the construction of Ocean View car line track and paving to the firm of Eaton & Smith.

Shreveport Railways, Shreveport, La., has authorized the A. C. Steere Company to construct approximately 1⅜ mile of line through Broadmoor, a suburb. The extension will cost about $100,000.

Altoona & Logan Valley Electric Railway, Altoona, Pa., recently purchased by A. E. Fitkin & Company, New York, plans to spend $200,000 this year in paving and trackwork.

British Columbia Electric Railway, Vancouver, B. C., it is reported, proposes to spend about $350,000 on improvements to its Vancouver Island properties during the year.

Stockton Electric Railroad, Stockton, Cal., will petition the City Council for a franchise for an extension of its Tuxedo Park line over Kensington Way to the College of the Pacific.

Key System Transit Company, Oakland, Cal., is working on the rebuilding of the track on Broadway between Tenth and Twelfth Streets, Oakland. The piece of track is being reconstructed with standard girder rail at a cost of $13,000.

Wisconsin Public Service Corporation, Green Bay, Wis., is preparing plans to build a track extension of 2,500 ft. and paving to its railway in Manitowoc.

Edmonton Radial Railway, Edmonton, Alta., Canada, it is reported, has submitted revised estimates for the construction of an extension along Portage Avenue. The original estimate was for $29,000, but the present one is for $38,950.

Power Houses, Shops and Buildings

Jamestown Street Railway, Jamestown, N. Y., plans to erect an automatic substation in the East End, to cost $50,000.

Boston Elevated Railway, Boston, Mass., is to start work at once on a heating plant to be erected on Surrey Street, Medford, Mass. Plans call for a one-story brick, steel and concrete building, 24 x 59 ft.

South Carolina Gas & Electric Company, Spartanburg, S. C., has renovated the garage on West Broad Street so as to use it to house the company's fifteen buses. The garage will have approximately 11,800 sq.ft. of floor space. A well-equipped repair shop will be provided.

Hartford & Springfield Street Railway, Warehouse Point, Conn., plans a terminal on Worthington Street, Springfield, Mass., for the accommodation of its bus service.

Trade Notes

Linde Air Products Company, New York, N. Y., manufacturer and distributor of oxygen for welding and cutting, has recently opened the following new district sales offices: 716 First National Soo Line Building, Minneapolis, Minn., C. E. Donegan, district sales manager; 409 Lincoln Life Building, Birmingham, Ala., W. A. K. Kopp, district sales manager; 508 Exchange National Bank Building, Tulsa, Okla., G. D. Grubb, district sales manager. The Linde company also announces the appointment of J. W. Foster as district sales manager at Baltimore. Prior to this appointment Mr. Foster was a senior salesman in the Pittsburgh Linde district.

Lawyer Railway Equipment Corporation, Syracuse, N. Y., has been chartered at Albany with $50,000 capital to manufacture railway equipment. F. A. Lawyer, G. E. Broan, 340 West Fayette Street, and C. A. Scriber, 617 East Fayette Street, Syracuse, N. Y., are the directors and subscribers.

General Electric Company, Schenectady, N. Y., received orders for the three months ended March 31, comprising the first quarter of the present year, amounting to $83,846,236, compared with $73,487,903 in the same quarter of 1924, according to an announcement by President Gerard Swope.

Yellow Coach Manufacturing Company, Chicago, Ill., announces the appointment of Francis J. Fox as sales representative for Yellow coaches in Iowa, Illinois, Chicago and St. Louis. Mr. Fox was formerly sales agent in Chicago and surrounding territory for the Griffin Car Wheel Company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has opened a branch office in Davenport, Iowa, locating temporary quarters in the Central Office Building. This branch may be located in the new headquarters building of the United Light & Power Company on completion of this structure late this year. D. R. Irvin, a graduate of Purdue University, with several years of service in the Westinghouse organization, has been placed in charge of the Davenport branch as district manager. The branch will cover the territory on both sides of the Mississippi River from Dubuque, Iowa, and the northern line of Illinois to Quincy, Ill., and Hannibal, Mo.

The Gould Coupler Company and the **Gould Storage Battery Company, Inc., New York, N. Y.,** have removed their offices from 30 East 42d Street to 250 Park Avenue, New York City.

C. B. Harvey, formerly branch manager of the Philadelphia territory for the complete line of Lapeer semi-trailers, has been appointed distributor for this same territory.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has reprinted in folder form an editorial which appeared in the ELECTRIC RAILWAY JOURNAL, Nov. 22, 1924, under the heading "Standardization of Contact Line Should Further Electrification." The editorial discussed the importance of adopting a common system of current supply in the progress of railroad electrification. To this discussion has been added comments on the editorial pointing out another factor to be considered. This added factor is the available power supply possible from public utility power companies, thereby relieving the railroads from heavy capital expenditures for electric power generating equipment.

Engberg's Electric & Mechanical Works, St. Joseph, Mich., has issued a new catalog, No. 105, on Engberg direct-current direct-connected generating sets. It is illustrated and contains 32 pages.

Garford Motor Truck Company, Lima, Ohio, has issued a sixteen-page illustrated pamphlet showing the developments which have been made by it in producing motor coaches.

Nichols-Lintern Company, Cleveland, Ohio, has issued a pamphlet entitled "Two Safety Ideas for Your Cranes."

Electric Railway Improvement Company, Cleveland, Ohio, has issued a new and comprehensive bulletin describing its line of arc weld rail bonds. This bulletin is known as Circular No. 13 and gives detailed information, including actual dimensions of the size, of arc weld bonds and their manufacture; illustrated data on the most efficient bonding procedure, and data on welding currents and welding rod. Copies are sent gratis on request.

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 23 and bulletin No. 2071 on safety hand lamps.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 2, 1925 *Number* 18

Operating Results for 1924 Indicate a Good Year in 1925

STATISTICS of electric railway operation in 1924, compiled by the American Electric Railway Association and made public this week, give much food for thought. The survey covered about 85 per cent of the gross business of the industry. The 370 companies included in the tabulation showed total operating revenues of $786,530,422, against $794,257,546 in 1923, a decrease of slightly less than 1 per cent. Far from being an unfavorable showing, this was better than might well have been anticipated in view of the industrial depression that lasted the greater part of the year. In his analysis of the situation E. J. Murphy, statistician of the association, compares the practically stationary traffic on the electric railways last year with a decrease in iron and steel production of 22.2 per cent, in automobile production of 10.3 per cent and in the Federal Reserve Board index of production of 22 basic commodities of 10 per cent. Even in the transportation business, freight car loadings fell off 2.6 per cent, and revenues of Class I steam railroads showed 5.9 per cent less gross.

With electric railway traffic, particularly in the industrial regions, sensitive to changes in business conditions, the result is quite remarkable. It shows in no uncertain manner the fundamental soundness of the industry and points the way clearly to an increase in business for the current year, with greatly improved business conditions.

On the other side of the ledger, there was also a slight reduction. The 370 companies had operating expenses of $581,288,567, against $584,674,342 in 1923, or 0.58 per cent less. This was not quite enough to offset the loss in revenue, as net operating revenue was 2.07 per cent off from the 1923 figure. As there was very little change in the indexes of costs during the year, this would indicate slightly less efficient operation.

With conditions for the first four months of this year at least as good as those of 1924, and no national political campaign approaching, it would appear that 1925 bids fair to be the banner year of the electric railway industry.

Certain Services Are Natural Monopolies

WHEN public utility companies advance the argument that unnecessary duplication of service is an economic mistake, and that unregulated competition in these industries is wasteful, some people are prone to assert that this is merely selfish propaganda. As a matter of fact certain services are natural monopolies and can function most satisfactorily when free from competition. An example which proves the truth of this contention is the action of the government in forbidding private competition with the postal service.

The United States government claims the sole right to carry letters and packets. Congress has passed laws imposing fines and imprisonment upon those who "shall establish any private express for the conveyance of letters or packets, or in any manner cause or provide for the conveyance of the same by regular trips or at stated periods, over any post route—or from any city, town, or place to any other city, town, or place between which the mail is regularly carried." Clearly the purpose of this statute is to prevent private competition with the postal service. The constitutionality of the act has been upheld by the Supreme Court. The reasonableness of it commends itself to all thinking people. Intolerable confusion would result if three or four different agencies were to undertake to do this work.

The same argument has equal force in connection with other services such as water supply, telephones, or transportation. Competition means confusion and waste. Through public service commissions or other similar bodies, the people exercise control over the utility companies as closely as, or more closely than, they do over the post office. If the latter can give better service when protected from destructive competition, so also can the utility companies. This fact is becoming more and more widely recognized, but constant reiteration of it appears to be necessary to counteract the efforts of the demagogues and local politicians.

Inflexible Operating Rules May Injure Electric Railway Service

DESPITE the lack of compelling necessity, there is sometimes a tendency to hamper electric railway operation with absolutely iron-clad and inflexible rules. Certain minimum requirements must be insisted upon for the sake of safety. Beyond that point it is desirable that regulations be established to govern car operation under normal circumstances. Rules of the latter class are intended to insure the rendering of high-grade service to the public. Too rigid adherence to such rules, however, may injure the service instead of promoting it.

When a request is received from some outside source to have a slight modification made in operating practice to accommodate a particular group of people, how often it happens that the management replies that such a thing cannot be done because it would be contrary to rules. By taking this attitude the railway loses friends and creates the impression that its service is incapable of meeting the needs of a particular situation.

An instance of this sort of thing is the failure of many street railway companies to arrange connections between their cars and steam railroad trains. For a car to leave the local railroad station exactly on schedule time, when a minute delay would accommodate a considerable number of people alighting from a train, is the worst kind of salesmanship. Some railways, on the other hand, pay particular attention to this matter and try always to have cars available for passengers arriving and departing by the steam railroads. In general, the direct financial return more than offsets whatever cost may be involved and the increase in public good will is an additional advantage.

Electric railways must, of course, be operated according to time tables. Generally speaking, the closer the adherence to schedule the better the service. But a schedule or any other operating regulation is a means to an end, not an end in itself. When these regulations assume a greater importance in the eyes of the management than does the convenience of the public, the railway is headed toward trouble.

Small Cities, Too, Have Acute Traffic Problems

UNDER the changed conditions of recent years traffic congestion in communities of medium size has become a problem no less trying to the railways than it is to companies that operate in large cities. This was made plain in a recent commission investigation in a city of 130,000. The commission found little cause for complaint about the physical equipment of the local railway, but it did find a basis for complaint about irregularity of service. It agreed with the company that service is necessarily affected by the width of the streets, by interruptions caused by railroad and canal intersections and the character of the police regulations, all matters over which the railway management has no control. On the other hand, the commission did make certain constructive suggestions pertinent in the case under review, and all of them equally pertinent in the case of other companies similarly situated. One of them was for a larger supervisory force, properly trained and with clearly defined duties.

In particular the commission pointed out that inspectors should be clothed with authority sufficient to correct interruptions to headways and to prevent undue layovers at terminals. Furthermore, it suggested that the duties of these inspectors at heavy loading points should be broadened to include the making of change for passengers pending the arrival of the cars. Moreover, it was suggested that at these heavy loading points the rear doors of the one-man cars be opened to permit passengers to enter upon payment of fare to the inspector or to some other person vested with authority to collect fares. But that was not all. Fully cognizant of the trying conditions imposed upon the company from outside sources, the commission recommended to the City Commission further regulation of traffic by the elimination of parking on streets which it designated and the diversion of traffic from streets on which trolleys are operated in so far as practicable.

The significance of the survey of the commission lies in the constructive suggestions made both to the railway and to the city. It is not easy always to say what is best to be done in a particular case. The conduct of many companies in communities of moderate size has been arranged on a plan that contemplates doing the very things the commission pointed out as advisable in the case under review. To them, of course, the commission's suggestions do not apply. However, even in the incomplete form in which the matter has here been set down the commission's suggestions do carry a valuable lesson to other companies. After all, physical equipment, however well maintained, and men, however well trained, are inadequate of themselves fully to cope with any problem unless directed intelligently under a measure of individual responsibility intended to bring out on the part of each man involved the fullest measure of service of which he is capable.

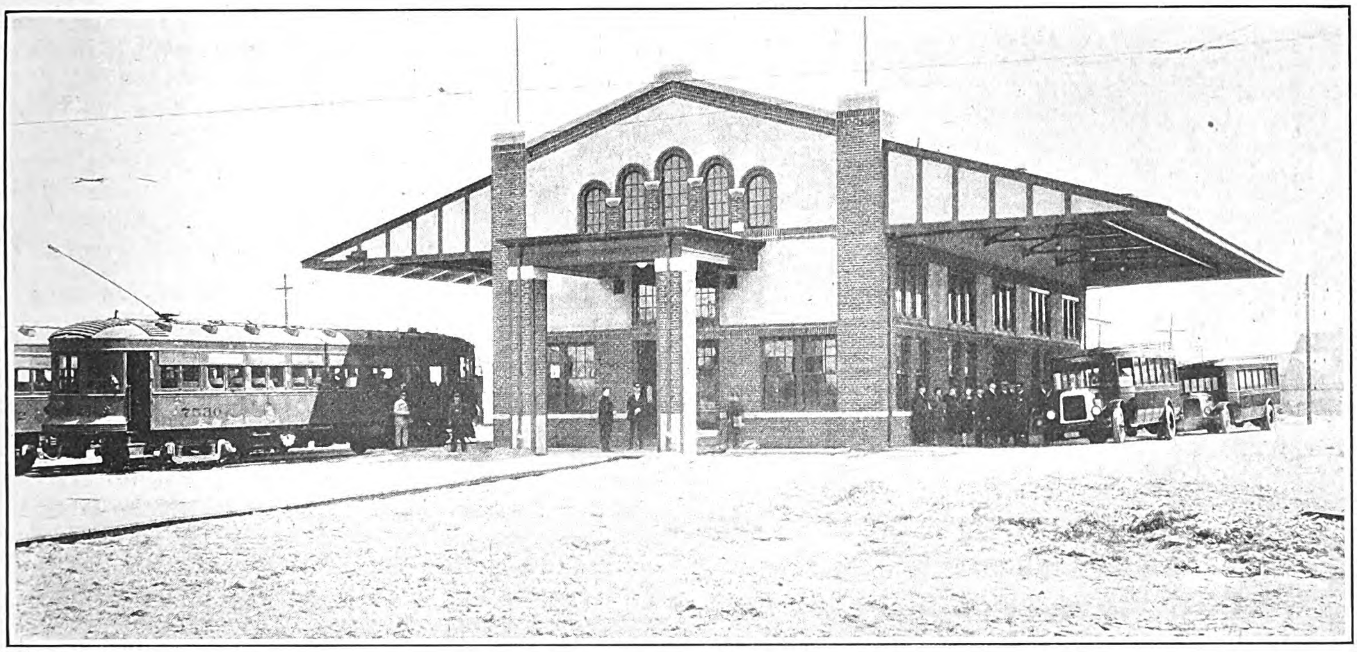
Preparations for Exceptional Crowds

BOTH electric and steam railways must on occasion handle exceptionally large passenger traffic to or from some event, usually an athletic contest or some kind of agricultural fair. On properties which have such events frequently, as in cities where the major baseball leagues play, the problem has become somewhat simplified because semi-permanent provision can be made to care for these large assemblages. In the college town where the great football game or baseball game is held, and in the county seat where the county fair occurs, on only one or, at most, a few days during the year, the problem is more complicated. The athletic field or fair ground is usually on the outskirts of the city and is served by only one route, so track capacity is limited. Rolling stock, feeder capacity and power, when designed for the average peak load of the year, also are limited, as is also the number of employees competent to operate equipment.

The similar problem of the steam line was considered at a recent meeting of the Institute of Transport held in London, England. At that meeting various "axioms" were laid down. A number of them are so pertinent to similar conditions on electric lines here that, somewhat paraphrased, they will be repeated:

> Careful selection of a well-trained and experienced staff to handle the special traffic, preference being given to men who have done this work before and thus have become familiar with the requirements.
>
> The necessity for clear and concise instructions to the staff concerned as to the arrangements for the movement of this traffic so that misunderstanding and error may be avoided.
>
> Early and general advertisement of the special facilities, with clear directions to passengers, and adequate signs on the day of the event, so that confusion may be avoided.
>
> Keeping interference with ordinary traffic facilities to a minimum. Regular travelers generally take the view that it is unjust to inconvenience them for the sake of the pleasure seeker, even though most of these regular travelers become pleasure seekers sooner or later.
>
> Careful study of the various problems, so that the best use may be made of available facilities without having to incur the expense of providing costly plants for infrequent use.
>
> Study of the traffic measures taken and the results obtained as soon as possible after the event, in order to apply the experience gained on future occasions.
>
> Close observation by responsible officers of the actual operation of traffic at strategic points, so that immediate action may be taken in the event of emergency.
>
> The closest possible co-operation between the railway and the organizers of events which produce large crowds, with a view to the removal of the usual difficulties.

As a rule these extra heavy days are not particularly profitable, because of the added expense of one kind and another which is involved. Nevertheless, the prestige of the company in the local community is greatly enhanced when such service is given on occasions of this kind. Knowledge of this, with the satisfaction which always comes from work well done in connection with an important local event, will insure cordial co-operation on the part of the entire staff participating. The problem then is really one primarily for the management. If the rules already mentioned had to be summarized in a few words, they would probably be to know what to expect, then make ample preparations for it. This, in fact, is the secret of success in any large undertaking.



The Combined Bus and Interurban Stations Are Built of Cinder Concrete Block Trimmed in Brick and Stone. Wide Canopies Extend Over the Car and Bus Loading Platforms on Each Side, and the Roof Is Carried Back Approximately 120 Ft. from the Rear of the Building to Cover a Large Open Platform

Interurban Passengers Transfer to Buses at Outlying Terminals

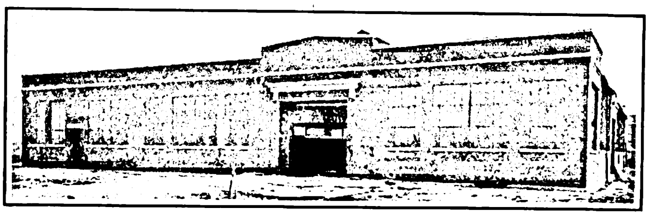
The Detroit United Railway Has Begun the Use of Buses to Transport Its Interurban Passengers Between the Downtown Waiting Room and Suburban Terminals—Interurban Cars Which Were Formerly Tied Up in Slow-Moving City Traffic Are Released for Added Service Outside the City

ELECTRIC interurban cars for the long haul, buses for the congested city run—that is an innovation just started on a large scale by the Detroit United Railway. A new terminal project has been carried out, so that facilities are provided for the comfort and convenience of the company's patrons.

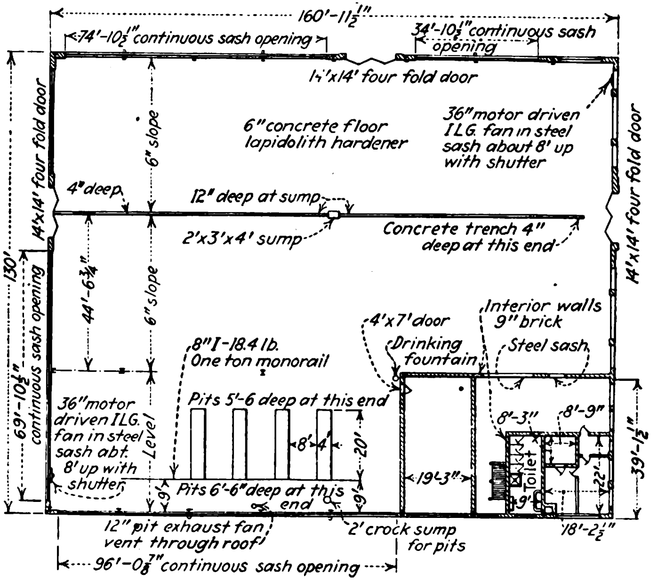
Buses are used to haul interurban passengers between newly constructed outlying terminals and the present downtown interurban waiting room. The passengers transferred between the interurban cars and the new buses are transported an average distance of 5 miles to the present downtown interurban station. A saving in time of between ten and twenty minutes is made from the time required for the interurban cars to come in over the city tracks of the Detroit Department of Street Railways. To give an approximate idea of the magnitude of this undertaking, approximately 10,000,000 passengers per year are transported into and out of the city over the various divisions of the interurban property.

As in most cities where interurban cars reach the business districts over street railway tracks, slow operation due to interference of city cars and other vehicular traffic has presented a serious operating handicap and has been a source of considerable annoyance to passengers. For some time past the D. U. R. has considered the possibility of linking up its interurban service with the various rapid transit schemes proposed for Detroit. The present plan of utilizing buses to carry interurban passengers into the city is the outgrowth of this study. It was found that the slowness of the interurban schedule within the city caused many passengers to leave the interurban cars at the city limits and complete the journey to the downtown section by jitneys.

The new bus service not only cuts down materially the time taken in reaching the center of the city, but it also results in a number of other operating advantages and economies, including shortened car schedules and reduction of interruptions and delays from city traffic interferences. Interurban cars, operating over the street railway tracks, make an average speed of approximately 9 m.p.h. The average speed outside the city on the main divisions of the interurban system is approximately 36 m.p.h. During the maximum load period there were about 65 interurban cars from the various divisions tied up in this slow-moving traffic



A Garage at Each Terminal Location Is Equipped with Shop Facilities and Underground Storage for Gasoline and Oil


160'-11½"
74'-10½" continuous sash opening
34'-10½" continuous sash opening
14'x14' four fold door
6" concrete floor lapidolith hardener
36" motor driven ILG. fan in steel sash about 8' up with shutter
6" slope
4" deep
12" deep at sump
2'x3'x4' sump
Concrete trench 4" deep at this end
14'x14' four fold door
14'x14' four fold door
130'
69'-10½" continuous sash opening
44'-6¾"
6" slope
Interior walls 9" brick
4'x7' door
Drinking fountain
Steel sash
8"I-18.4 lb. One ton monorail
Pits 5'-6 deep at this end
36" motor driven ILG. fan in steel sash abt. 8' up with shutter
Level
8'
4'
20'
19'-3"
8'-3"
8'-9"
Toilet
22'
9'
39'-1½"
9'
Pits 6'-6" deep at this end
9'
12" pit exhaust fan vent through roof
2' crock sump for pits
18'-2½"
96'-0⅞" continuous sash opening

Floor Plan of the Garages, Showing Arrangement for Draining and Ventilating. The Shop and Storeroom Are Located at One Corner of the Building

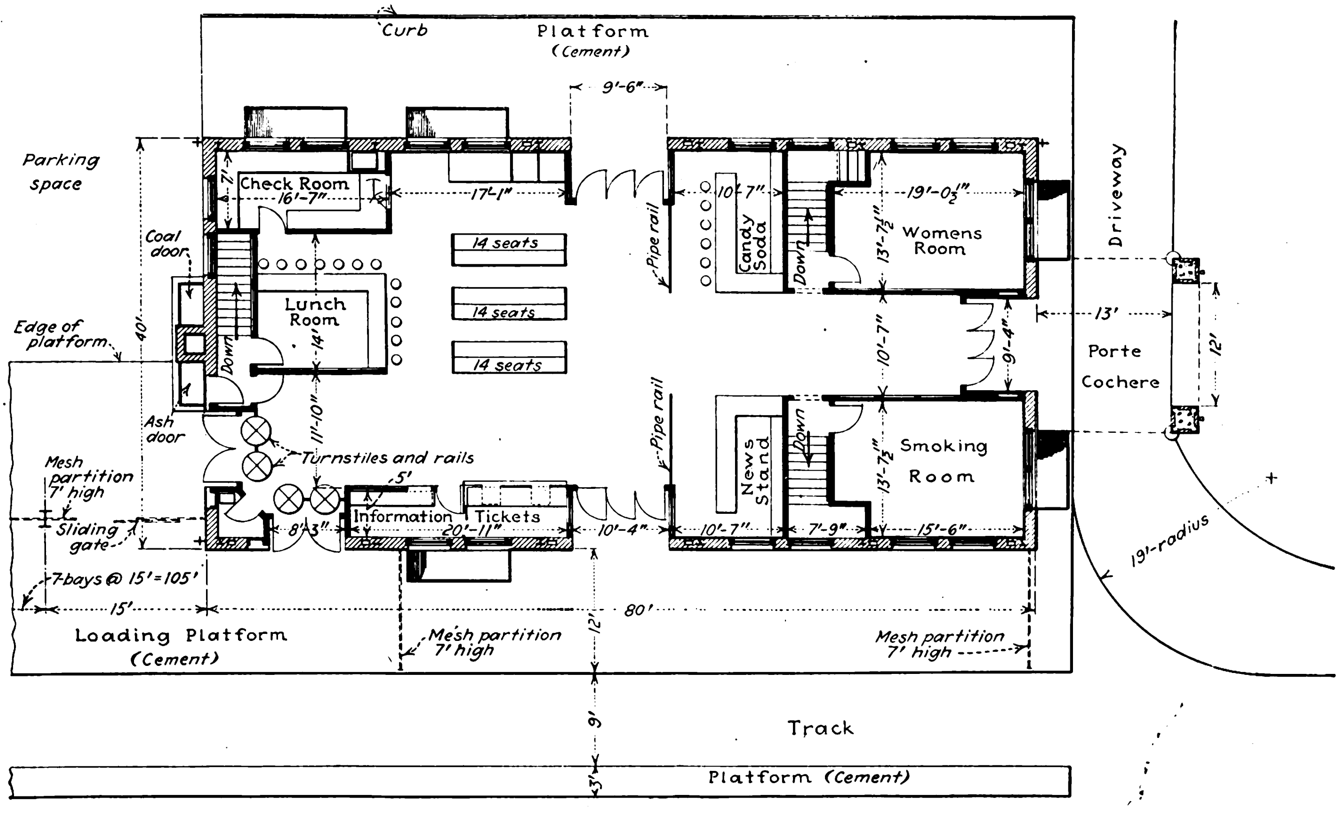
inside the city limits. By substituting buses inside the city approximately 50 of these cars ultimately will become available for additional interurban service. Operating at 36 m.p.h., they then will be approximately four times as useful as when moving at 9 m.p.h. inside the city. In addition to the improvement in service and the economies resulting from this better utilization of existing car equipment, a large part of the $500,000 per year now paid to the city of Detroit as rental for operation of its interurban cars over the city tracks will also be saved. It is expected that the entire cost of bus operation will be absorbed by these economies and that the combined system will show a substantial surplus.

Three new interurban-bus terminals are rapidly nearing completion, and two of them have been put in service. Each terminal, in addition to the station building, includes storage tracks and inspection pits for interurban cars, together with a complete garage and machine shop for storage, inspection and repair of buses. Underground tanks for gasoline and lubricating oil together with a small inspection and wash building for interurban cars complete the layout at each terminal.

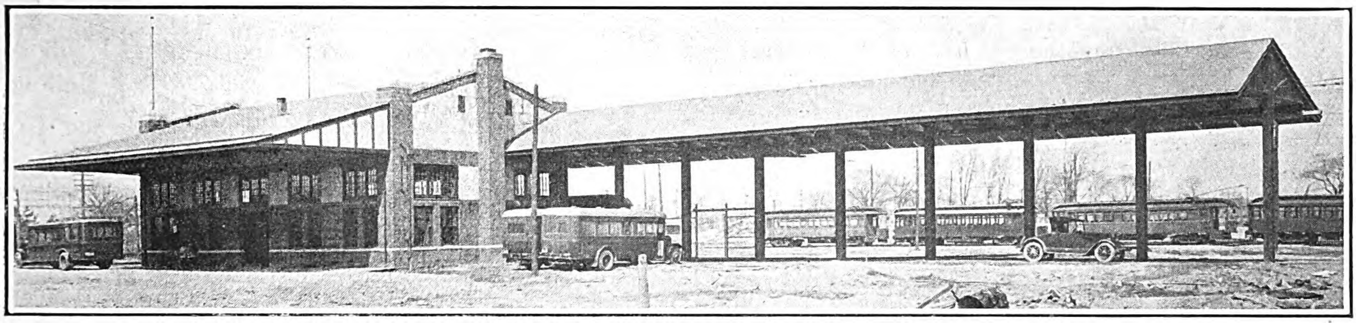
THREE STATIONS PLACED OUTSIDE CONGESTED AREA

These stations are located inside the city limits at points on the interurban routes, which are as close as possible to the downtown business area and are still outside of the area of heavy traffic congestion. Track connections to the various divisions are made either on interurban private right-of-way or on streets carrying what is known as class D tracks on which the D. U. R. has operating rights without payment of trackage charges to the city. This arrangement is the result of the surrender by the D. U. R. of unexpired franchise rights on outlying sections of track on certain streets at the time the street railway property was sold to the city. In return for the surrender of these unexpired outlying franchises, the D. U. R. was given operating rights over this track free of trackage charges.

One station is located near Gratiot Avenue and the Detroit Terminal Railroad in the northeastern section of the city, approximately 5½ miles from the downtown interurban waiting room. This station is on the Rapid Railway division of the D. U. R., which extends northeast from Detroit through Mount Clemens and Marine City to Port Huron. A second and similar station is in process of construction on Woodward Avenue opposite the Highland Park plant of the Ford Motor Company. This location is approximately 6 miles from the present downtown terminal and serves the Pontiac and


Curb
Platform (Cement)
9'-6"
Parking space
Check Room
16'-7"
7'
17'-1"
Coal door
14 seats
14 seats
14 seats
Lunch Room
14'
Down
40'
Edge of platform
Ash door
11'-10"
Pipe rail
Pipe rail
10'-7"
Candy Soda
Down
13'-7½"
19'-0½"
Womens Room
10'-7"
9'-4"
Driveway
13'
Porte Cochere
12'
News Stand
Down
13'-7½"
Smoking Room
Turnstiles and rails
5'
Mesh partition 7' high
Sliding gate
8'-3"
Information
Tickets
20'-11"
10'-4"
10'-7"
7'-9"
15'-6"
19'-radius
7-bays @ 15'=105'
15'
80'
12'
Loading Platform (Cement)
Mesh partition 7' high
Mesh partition 7' high
9'
Track
3'
Platform (Cement)

The Station Buildings Were Laid Out to Facilitate the Quick and Convenient Interchange of Passengers Between Cars and Buses



Pleasing Architectural Treatment of the Station Buildings Gives the Impression of High-Grade Service. Passengers Pass Directly Through the Building When Transferring Between Cars and Buses

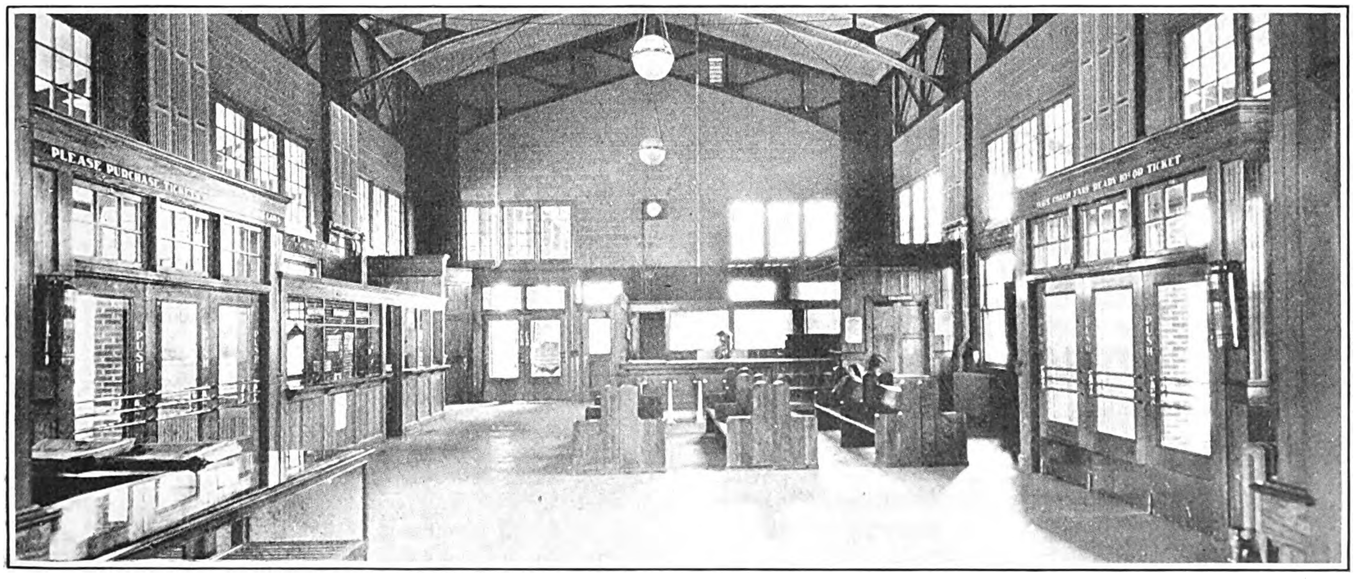
Flint divisions of the interurban. Still another is located on Fort Boulevard, approximately ¾ mile south of the blast furnaces at the Ford River Rouge plant. This station is about 6 miles from the downtown terminal and is on the D., M. & T. S. L. Railway division, leading south from Detroit to Toledo. At each of these locations similar facilities are provided.

The Gratiot terminal is typical of the others and is shown in the accompanying illustrations. It is located on a 21½-acre tract. In addition to the building, it includes a garage 130 ft. x 160 ft., capable of housing 50 buses, together with a service shop, office and stock room. Underground gasoline storage tanks with a total capacity of 80,000 gal. and additional tanks to hold 12,000 gal. of lubricating oil have been installed. Switch tracks and storage tracks for interurban cars, open inspection pits and a 30-ft. x 100-ft. galvanized-iron inspection and wash building are provided. Space is also available for a future freight terminal on this property, whose convenient location relative to the Detroit Terminal Railroad makes it advantageous for developing freight facilities at this point.

It was considered advisable to erect high-grade station buildings of pleasing architecture and permanent construction in keeping with the high-grade service they render. Particular care was taken in working out the plan to avoid makeshift facilities. The station building is constructed of cinder concrete block. trimmed in pressed brick and stone. It is finished on the outside in stucco and is painted in the interior. The roof is carried on structural steel girders which extend out over the walls to form wide canopies over the interurban loading platform on one side of the building and the bus loading platform on the other side. At the front, a porte-cochère extends over a driveway conveniently connected to the street for the use of private vehicles, taxicabs, etc. The roof is carried back approximately 120 ft. from the rear end of the building to cover a large open platform. This construction is arranged so that the building can be enlarged in the future without disturbing the roof. Provision is also made to allow the construction of glazed side walls at the eaves of the canopies if this ever becomes desirable.

The interior of each station is arranged to allow the convenient interchange of passengers between cars and buses. In addition complete waiting room accommodations are included for passengers starting or terminating their journey at this point. Wide doors on each side of the building allow direct communication between the interurban and the bus platform so that passengers may move directly and quickly through the building from one vehicle to the other. Wire mesh partitions and gates are arranged to control the movement of passengers. In the interior of the station a women's rest room and men's smoking room are located in opposite front corners. Wide stairways lead from each of these rooms to wash rooms and toilets below. Space for various concessions, such as cigar and news stand, lunch room, check room, shoe-shining stand, public telephones, candy and soda counter, is provided, and station type benches are installed for waiting passengers.

It is expected that independent bus lines as well as the intercity buses recently acquired by the D. U. R. and operated independently of the interurban service



Complete Accommodations for the Convenience of Passengers Are Provided in the New Stations may ultimately utilize these stations as terminals. The track layout will permit the city cars of the Department of Street Railways of Detroit to be operated directly into the property for the convenience of passengers transferring between street cars and interurbans.

A floor plan and exterior view of the garage building are also shown in accompanying illustrations. Its dimensions are 130 ft. x 160 ft. Ample drainage facilities make it convenient to wash buses, and four inspection pits 4 ft. wide by 20 ft. long facilitate inspection and maintenance. Wide glass areas in the building walls insure ample natural illumination, and 36-in. motor-driven exhaust fans installed at diagonally opposite corners of the building are designed to keep the interior free of gas fumes. At one corner are located the office, store rooms and shop space, together with toilet and wash rooms. Donaldson & Meier of Detroit acted as architects for the station building, and the Austin Company, general engineer and builder, designed the garages and is doing the general construction work at the three terminals.

Room is available at each terminal to store private automobiles which may be driven to the terminal from their owners' homes in the city. This is expected to encourage automobile owners to use the interurban, instead of driving their private cars considerable distances out of Detroit because of the convenience which these cars afford in getting about within the city area.

Besides the saving in time afforded by the use of buses between the new outlying terminals and the center of the city, the flexibility of the buses is expected by the company to permit other innovations in operation that will add to the convenience of the service. Since several buses will be required to handle the load on each interurban train, it is expected that these will be operated on various routes to and from the business section and the outlying stations. One or more of these buses will probably be operated on the most direct route, so as to make the trip in as short a time as possible. By having the remaining units take various other routes in reaching the downtown station, passengers may be enabled to reach their ultimate destinations in the most convenient manner. In addition, if it seems advisable, one may call at the important hotels for the convenience of traveling men and others using the interurban.

Single-deck coaches of the "Z" type, manufactured by the Yellow Coach Manufacturing Company of Chicago, are used in this terminal service. A special long wheelbase of 228 in. permits a seating capacity of 29. The seats are leather upholstered, and the entire interior finish has been designed to carry out the idea of high-grade service. Forty of these buses have been purchased. It is expected that approximately 35 will be required to maintain the regular service, the remaining vehicles being used as spares.

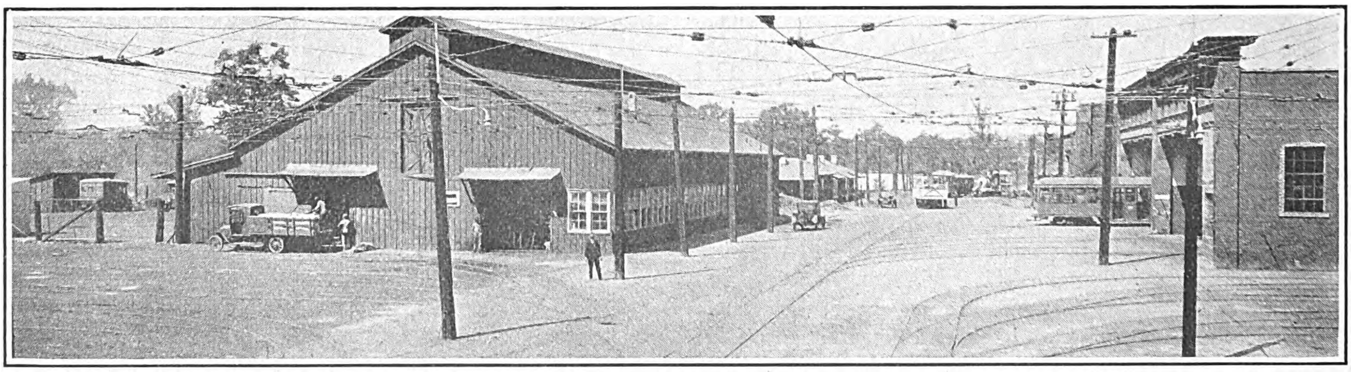
A cash fare of 10 cents is charged for the trip between the terminals and the center of the city. Interurban tickets are printed with a bus coupon attached. No passengers are handled locally within the city, although inbound buses drop passengers at any intermediate point and outbound buses pick up passengers for the outlying terminals.

All phases of the terminal bus operation are handled by the People's Motor Coach Company, a separate subsidiary organization which operates interurban buses to various points in the state and also handles the local service in Flint, Ann Arbor and Port Huron.

Drivers for the Detroit terminal service have been transfered from train service on the D. U. R. These men wear distinctive bus uniforms and are specially trained for their new work.

Yard Tracks Built for Hard Service

DURING the past year the Birmingham Electric Company rebuilt the special work at its main carhouse and repair shop. Two new storage yards were added alongside the existing buildings. At the same time the carhouse at the eastern end of the city was abandoned and arrangements were made to operate all cars from a single station. This was particularly advantageous on account of the central location of the main shop and carhouse.



All Special Work at the Entrance to the Main Carhouse of the Birmingham Electric Company Has Been Renewed, Using 7-In. 140-Lb. Guard Rail

In renewing the special work and constructing the two storage yards 7-in. 140-lb. A. E. R. E. A. guard rail was used throughout. Solid manganese switches with hard center frogs and mates were installed. In place of the ordinary bolted compromise joint between the special work and the straight rail, thermit welded joints were used.

The general layout is divided into two sections with all tracks in each section being continuous loops. This was done to make all parts of the yard as accessible as possible. An interesting feature of the arrangement is that the roadway between the two principal sections has been paved with brick for a width of about 80 ft. To facilitate the replacement of a car on the rails in case of derailment all special work is paved regardless of whether the track is paved or not. Moreover, in this case the brick pavement is helpful to the railway itself for the use of trucks delivering material, buses entering the company's garage, etc.

Rapid Transit Cars in Berlin

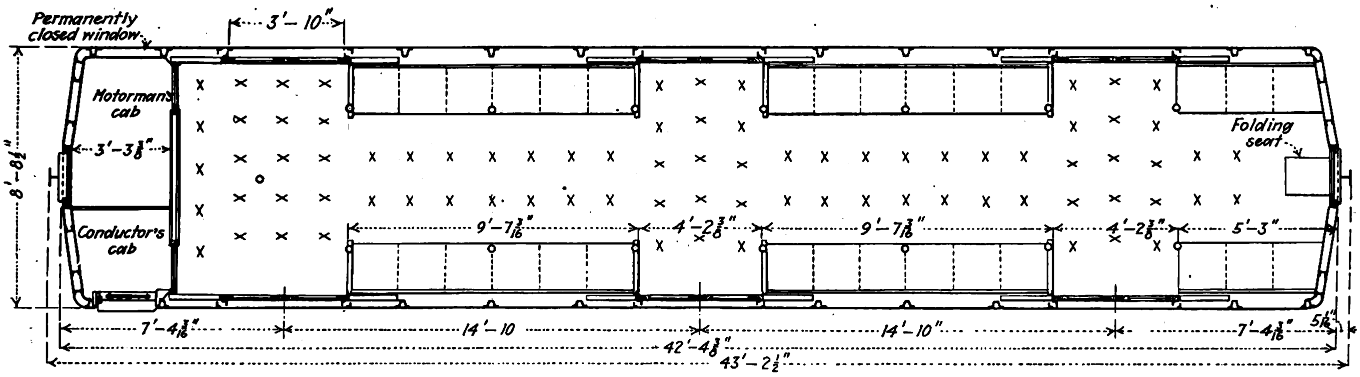
Semi-Steel Cars for Elevated and Subway Service Have Monitor Roofs, Hand-Operated Double Sliding Doors and Linoleum-Covered Floors—Tunnels of Different Size Require Two Sizes of Cars

THE standard type of car on the Berlin elevated and underground system is shown in the accompanying illustrations. This Berlin rapid transit system consists of two divisions—the original line, roughly in the form of a Y, operating in a general easterly and westerly direction across the city, and a north and south division, recently opened. Both are owned by the Gesellschaft für elektrische Hoch-und Untergrundbahnen in Berlin, known briefly as the "Hochbahn Gesellschaft."

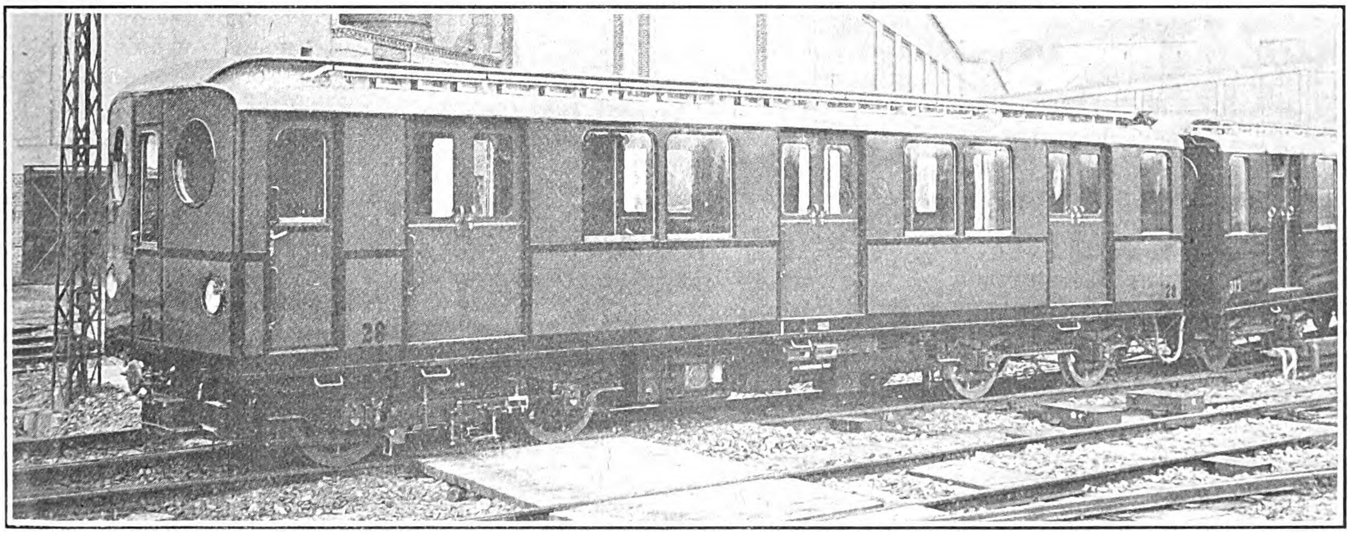
On the newer division, operating north and south, the clearances are somewhat greater and the curve radii longer. Hence somewhat longer and wider cars are used on this division. Otherwise, the appearance and construction features of the cars are alike. The main dimensions of the cars on the two divisions follow:

DIMENSIONS OF CARS ON BERLIN RAPID TRANSIT SYSTEM

	Original System	North-South Railway
Length over buffers..............................	42 ft. 1 in.	43 ft. 2½ in.
Height of empty car from top of rail to top of roof	10 ft. 5½ in.	10 ft. 5½ in.
Width outside of side panels....................	7 ft. 5 in.	8 ft. 8½ in.
Distance between truck centers.................	24 ft. 10 in.	26 ft. 2¾ in.
Wheelbase of truck on motor car...............	5 ft. 10¾ in.	7 ft. 3¼ in.
Wheelbase of truck on trail car..................	....	6 ft. 6 in.



Plan of Standard Motor Car with Third-Class Seating Arrangement, North-South Railway, Berlin Rapid Transit System
The cross marks show space allowed for standing passengers

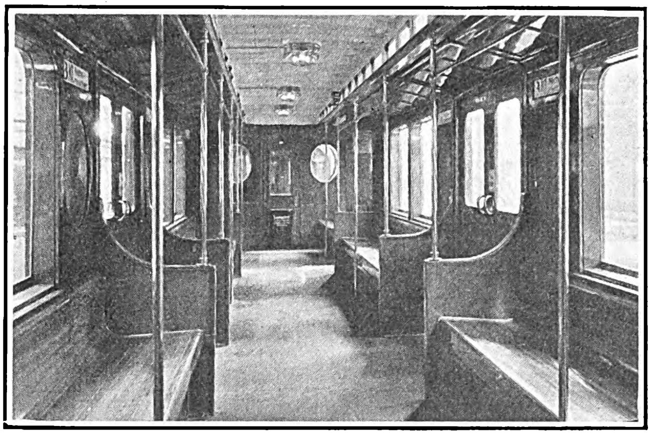


Semi-Steel Side-Entrance Motor Car, North-South Railway, Berlin Rapid Transit System

The cars are of semi-steel construction. The underframing and side framing are of steel, and steel side panels are used. The roof, seats and inside trim are of wood, the roof being covered with canvas. The floor is made up by a layer of asbestos on sheet steel and an upper flooring of pine, tongued and grooved, then covered with one layer of linoleum. The windows have single sash and are arranged to be lowered about 10 in. The end windows are oval shaped and also can be lowered about the same distance. Ventilation is obtained by means of these drop sash and by the deck sash in the monitor roof.

The third-class cars on the North-South Railway, as shown in the illustrations, have three doors on each side, each door opening having a clear width of 4 ft. 2⅜ in. The double doors at each opening are held together, when closed, by a latch, which may be released on the inside by a passenger or on the outside of the car by a trainman. The doors slide into pockets on each side of the doorway. The cars on the older division, which are somewhat shorter, as described, have two side doors instead of three.

The third-class cars on both divisions are fitted with longitudinal side seats of wooden slats, veneered. In the second-class compartments the seats are upholstered. In the car shown the seats are carried right up to the doorway, but in some recent cars, as described in the issue of Feb. 21, page 310, a space is left between the end of the seat and the door opening. The end door is for emergency use only, and in front of the door, as shown on the plan, is a folding seat. The stanchions and wooden horizontal rods for handholds, characteris-



Interior of Third-Class Car, North-South Railway, Berlin, Showing Seating Arrangement, Stanchions, Etc.

tic of the cars on the Berlin Elevated Railway, are conspicuous in the interior view.

The interior finish of the car is highly polished varnished natural oak. The upper deck ceiling contains no headlining; the carline and roof boards are painted white. The deck sash and framing are also painted white. Below the deck sill, however, a natural oak finish is used. The lower deck ceiling is paneled in oak, matching up with the inside trim and side panels. No advertising signs are carried in the interior of the car.

Six lighting fixtures are mounted on the upper deck ceiling. These are equi-spaced down the center of the car. Each fixture consists of three lamps covered with a clear glass bowl. The wiring for these lights is carried in conduit along the outside of the car just above the deck sash, as shown in the exterior view. A small conduit placed alongside of a carline connects the main conduit with each lighting fixture.

The plan shown is that of a motor car and has at one end a cab for the motorman on the right and one for the conductor of the train on the left, or the platform side, of the car. There is a door for entrance to each cab from the exterior as well as from the interior of the car, and there is a window between the two cabs so that the conductor can watch the motorman. The motor car shown has a seating capacity of 31 third-class passengers. With the end cabs removed, as on a trail car, the seating capacity would be 38. The space for standing passengers in the motor car is estimated to be adequate for 82 passengers and in the trail car for 81 passengers. On both divisions the company operates two classes, second and third, but no first class. It also has smoking and non-smoking compartments.

Nickel steel axles are used with steel-tired wheels. Current is obtained from an under-running third rail shoe. Each motor truck carries two 85-kw. motors operating on 750 volts, d.c. The maximum speed is about 31 m.p.h. The cars are fitted with hand brakes and automatic air brakes. The latter are capable of being set by an automatic trip device in the track, in case a train runs past a signal.

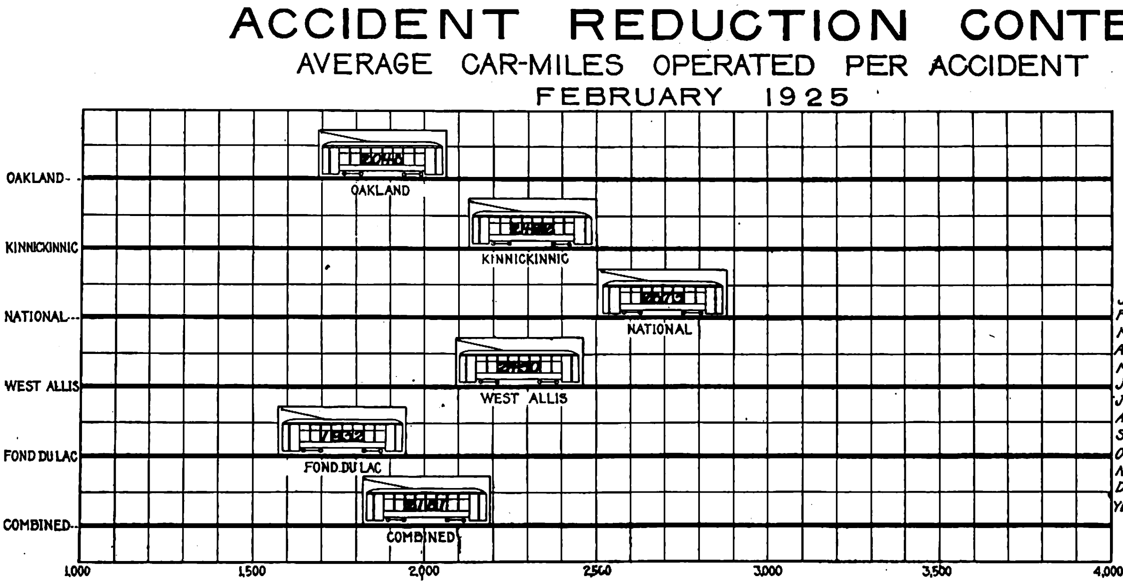
Milwaukee Holds Accident Reduction Race

A NEW form of contest is being conducted by the Milwaukee Electric Railway & Light Company in an effort to reduce accidents on its lines. In this plan each carhouse on the city system is assumed to be in a race, and the position of each of the divisions is shown by miniature cars on a large chart posted in each station.

The position of each car along the line representing its track shows how many miles were operated by that division per accident for the month. The chart illustrated is for the month of February and shows National station in the lead with a total of 2,873 car-miles operated per accident. Kinnickinnic and West Allis are close contenders for second place, while Oakland and Fond du Lac bring up the rear. Both these latter stations are shown to be below the average for the combined system.

At the right is a table containing the records for previous months. The figures for the winning station are shown in heavy marking. For the month of February the average was 2,181 miles per accident as compared with 1,846 for January, a gain of more than 18 per cent.

A cup is awarded each month to the winning station in the race and remains in that station until one of the others gets into the leading position. In addition, ten prizes, consisting of articles of practical utility, such as caps, changers, electrical appliances for the home, etc., are awarded each month to the winning station and are distributed to the men by lot.



RECORD OF PREVIOUS MONTHS

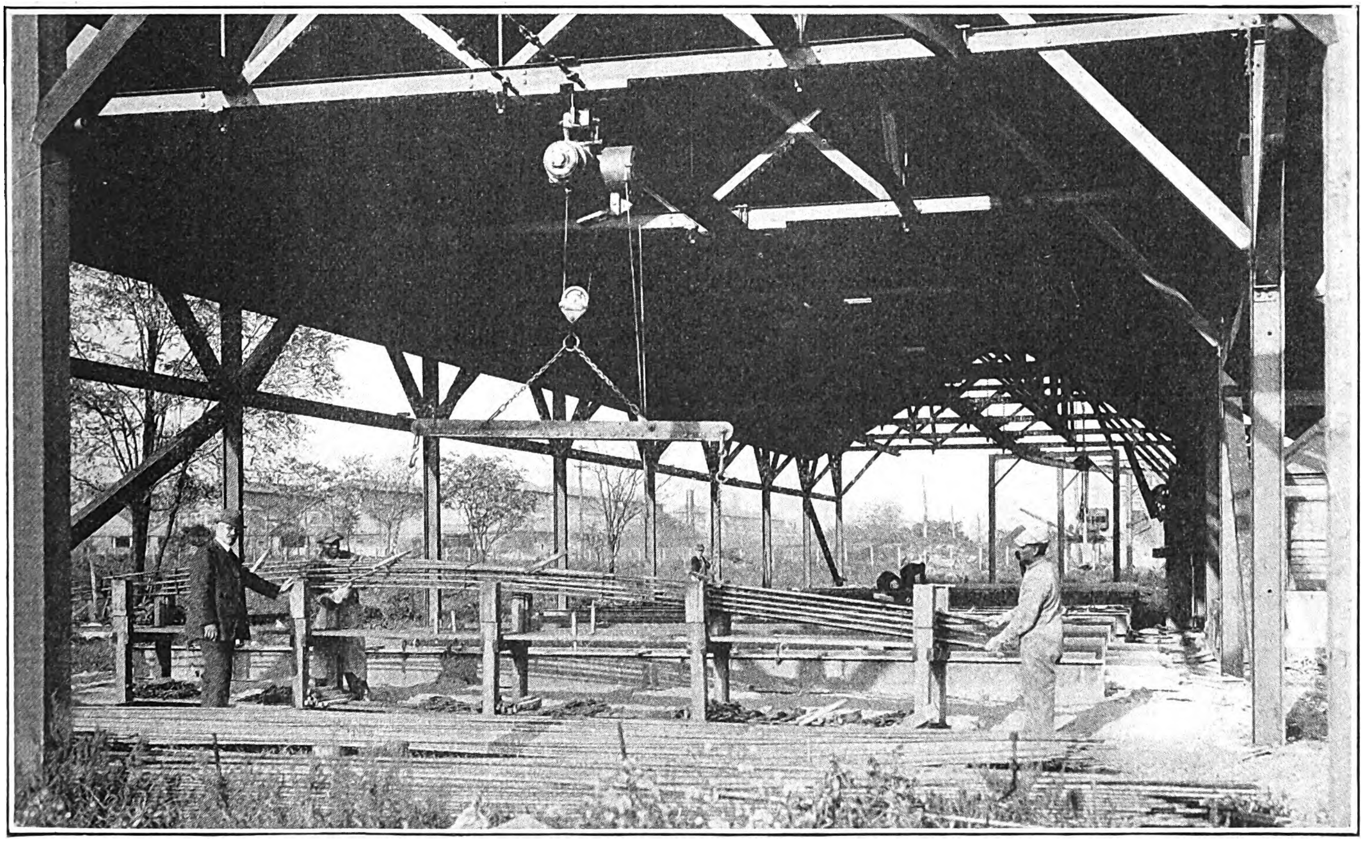
	OAKL.	K.K.	NATL.	W.A.	FOND.	COMB.
JAN.	1996	2045	2286	1937	1571	1846
FEB.	2046	2492	2873	2450	1932	2181
MCH.						
APR						
MAY						
JUNE						
JULY						
AUG.						
SEPT.						
OCT						
NOV.						
DEC						
YEAR						

The Position of Each Station in the Milwaukee Accident Reduction Race Is Shown by a Miniature Car. The Leader Is the Station Operating the Greatest Number of Car-Miles per Accident. Comparative Figures for Previous Months Are Shown at the Right.

Railway Builds Concrete Trolley Poles in a Modern Plant

United Railways & Electric Company of Baltimore Has Adopted the Reinforced Pole as Standard Construction—Equipment Has Been Installed to Manufacture at the Rate of Ten Poles per Day—Steel Forms Are Used

By W. W. Wysor
Chief Engineer United Railways & Electric Company, Baltimore, Md.



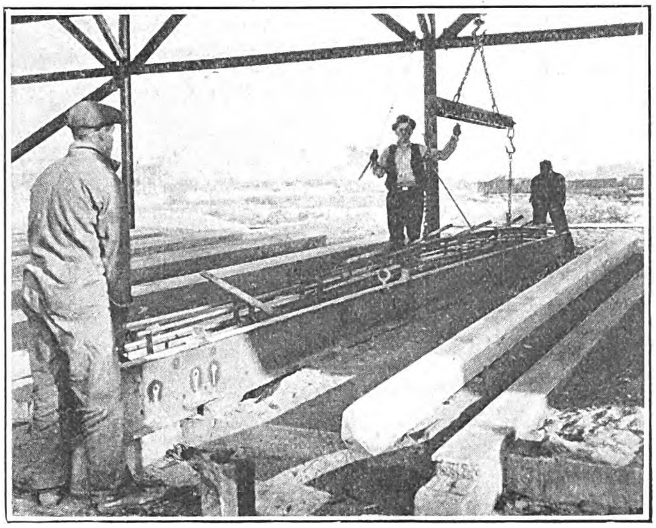
Reinforcement Assembled and Ready to Be Placed in the Form

IN A LIMITED way the United Railways & Electric Company of Baltimore has been using concrete trolley poles for the past twelve years. As they have proved entirely satisfactory it was decided a year or two ago to adopt them as the company's standard construction. Prior to 1924 concrete poles were manufactured by this company from time to time in an open yard, using wood forms. Not more than 100 poles were made in any single lot. While fairly satisfactory poles could be made in this way it was realized by the management that better facilities would be desirable if the poles were to be manufactured in larger numbers. A new plant for this purpose was completed and put in operation in the fall of 1924.

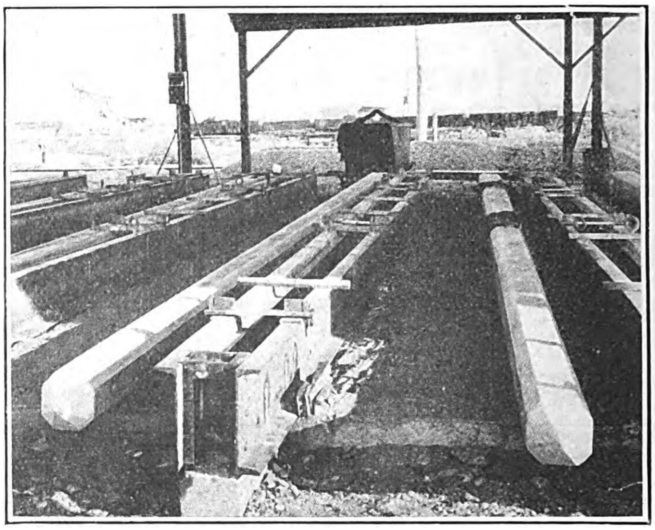
The plant consists of three main parts—a molding shed, a mixer shed and a storage yard. The molding shed is 160 ft. by 30 ft. and protects the workmen as well as the freshly-made poles from the weather. A mixer shed 80 ft. by 12 ft. 6 in. accommodates the mixing apparatus and provides storage room for cement, etc. Completed poles are piled in a storage yard connected with the molding shed by an overhead runway.

Reinforcement for the poles is provided by fourteen ¾-in. round steel rods. Of these four are 29 ft. 8 in. long, four are 23 ft. 6 in., four are 17 ft., and two are 12 ft. The poles themselves are nominally 30 ft. in length, although the actual over-all dimension is 30 ft. 3½ in., including the pointed top. Reinforcing rods are held accurately in place by ten sets of short plates or strips punched with holes to receive the rods. These strips form rectangles of such size that the centers of the rods are 1½ in. from the outer face of the concrete. The rods are assembled in cage form on a special workbench at one end of the molding shed. The appearance of a completed cage is shown at the top of this page.

On account of warping, cracking, etc., the wood forms used in the old process of making concrete poles in Baltimore frequently got badly out of shape and had to be replaced. For this reason steel forms are used in the new plant. There are 30 permanent beds and twenty sets of forms. Each bed is a tapered steel plate permanently secured to a concrete foundation. This shapes one side of the pole. The sides are formed by two steel channel plates clamped securely in position.



Lowering the Reinforcement into Position in the Form

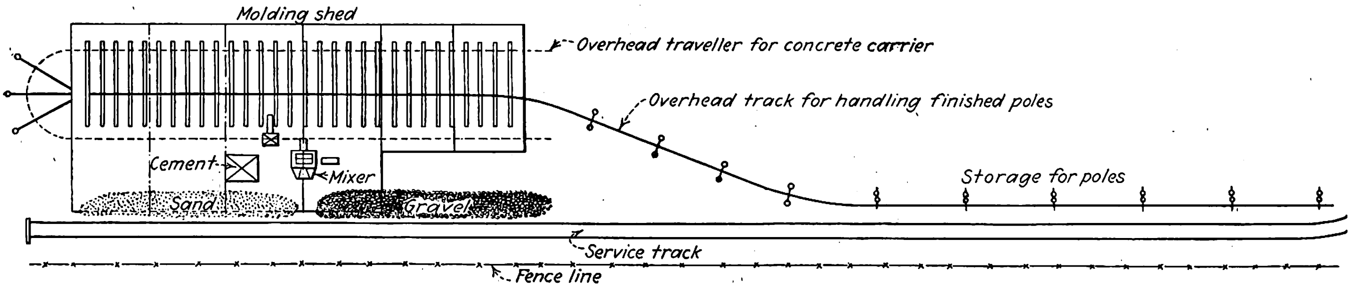


Form Set Up Ready for Concrete to Be Poured

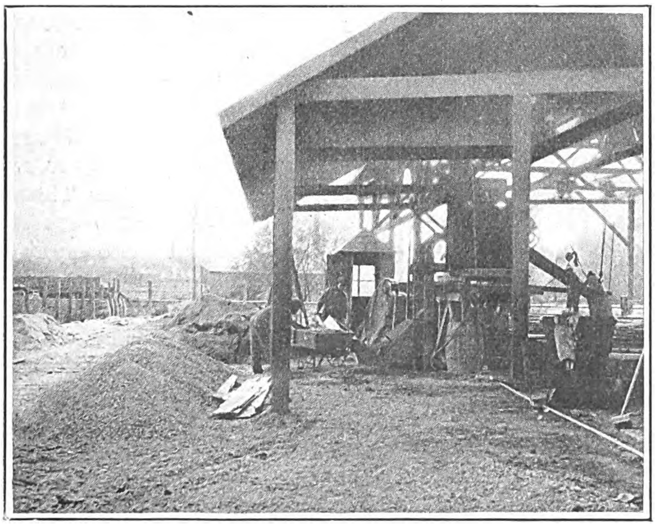
Triangular hardwood strips are fastened to the side forms by screws to chamfer the edges of the pole. Tops and bottoms of the poles are formed by cast-iron plates inserted between the side channels. The pyramidal form of the top of the pole is molded by the cast-iron end piece. Reinforcement is suspended by wire from wood crosspieces. The appearance of a form set up and ready for concrete is shown above.

A concrete mixture of 1-2-3 is used. The aggregate is ⅜-in. to ¾-in. mixed gravel. In the old process concrete was mixed by hand, but in the new plant a Ransome mixer is mounted opposite the center of the molding shed and at a suitable elevation for discharging into a bucket. The mixer is loaded by means of a skip hoist. Sand and gravel are accurately measured in boxes specially constructed for this purpose and mounted on wheelbarrow frames. A concrete bucket which receives the concrete from the mixer is handled on a bucket runway extending the full length of the molding shed on both sides. This is entirely separate from the runway for the electric hoist which handles reinforcing rods, steel forms, completed poles, etc. The concrete mixing apparatus is shown below.

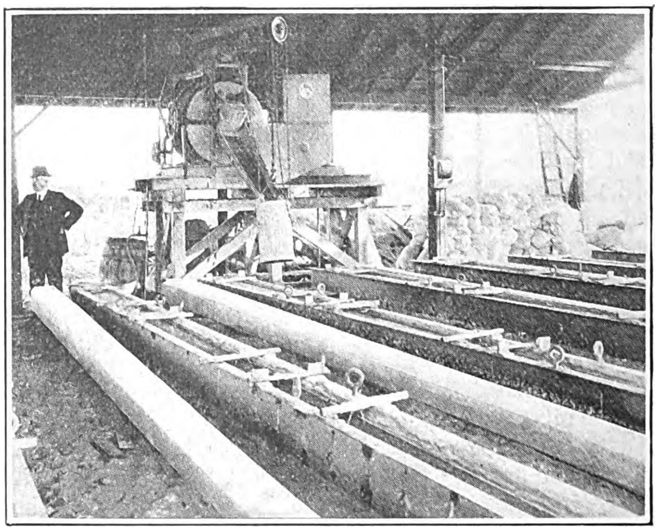
Procedure in casting the poles is as follows: Sets of steel side forms are set up in place. Reinforcing rods which have been assembled at the workbench referred to in a preceding paragraph are brought over by means of an electric hoist and lowered into position.


Molding shed
Overhead traveller for concrete carrier
Overhead track for handling finished poles
Cement
Mixer
Sand
Gravel
Storage for poles
Service track
Fence line

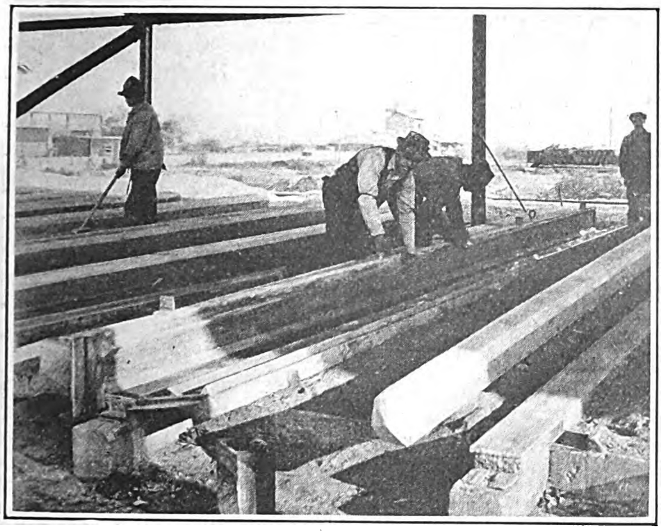
Layout of Concrete Pole Plant of the United Railways & Electric Company of Baltimore



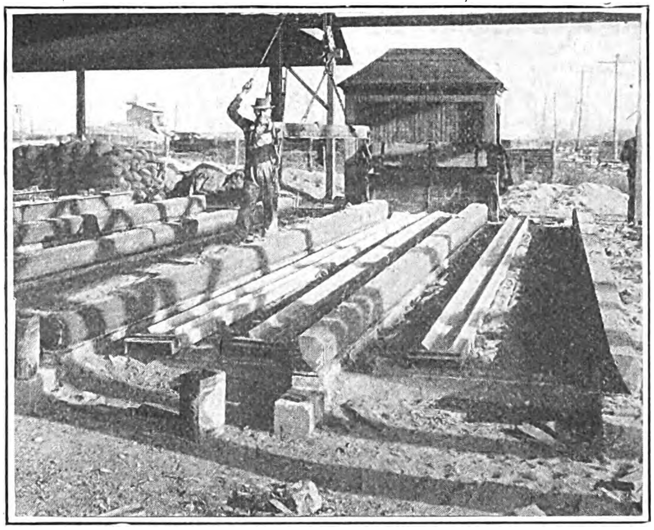
Concrete Mixer Is Located in a Separate Shed Alongside the Molding Shed



Discharging Side of Concrete Mixer and Bucket Used for Filling Forms



After Three or Four Days Hardening Poles Are Rolled Off the Steel Beds onto Sand Beds Alongside



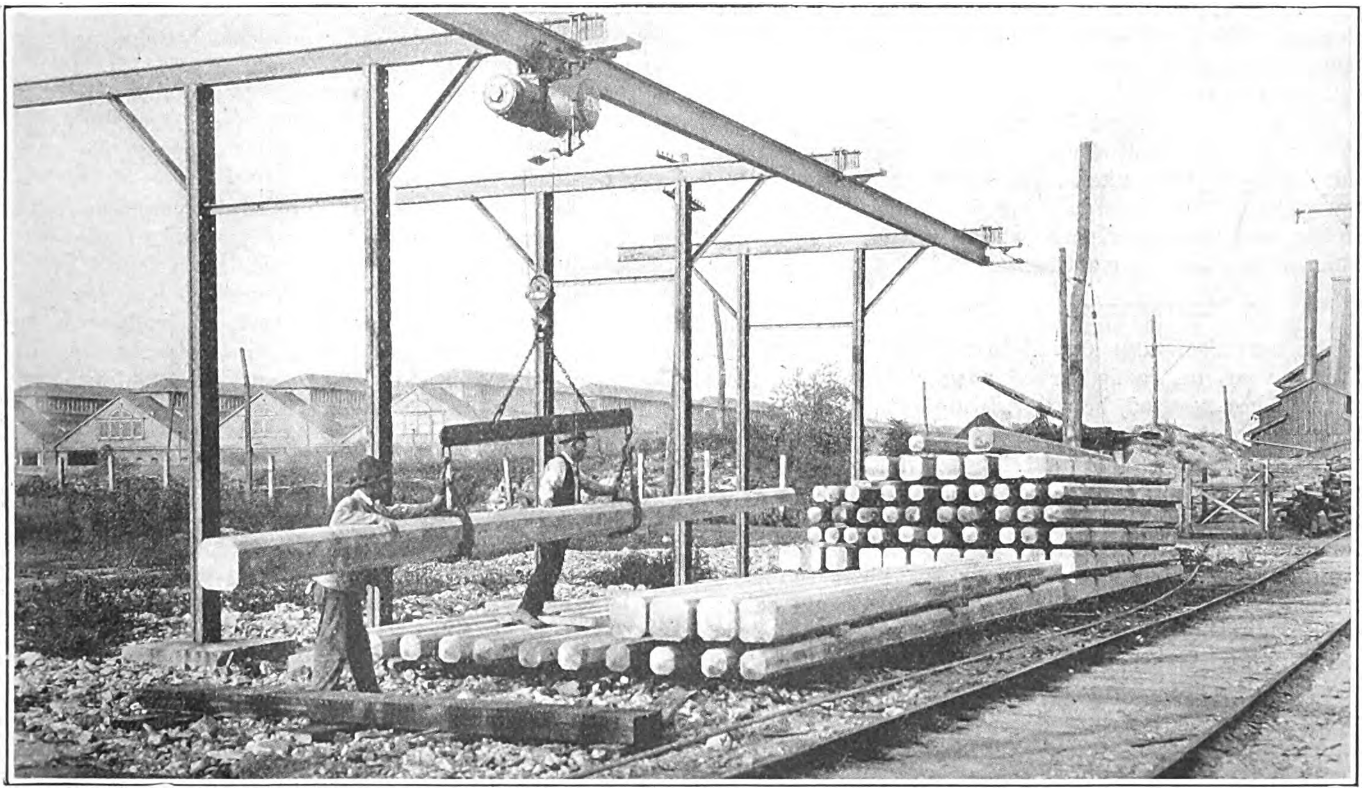
Electric Hoist Ready to Pick Up a Finished Pole and Carry It to the Storage Yard

This process is shown in an illustration on the preceding page. Concrete is then poured into the forms and thoroughly worked into place around the reinforcing rods. Particular care is taken to see that all voids are thoroughly filled. The top surface is troweled off to a smooth finish.

After the poles have hardened for a period of 24 hours the side forms are removed and set in place on the ten other beds. When the hardening process has continued for three or four days the poles are rolled off the steel beds onto sand beds immediately alongside. The method of removing the forms and the sand beds on which the poles rest during the hardening are shown in the illustrations above. This frees the forms for the making of other poles.

After the poles have hardened for a period of ten days or more, depending somewhat on the weather, they are picked up by the electric hoist and carried to the storage yard. This hoist is equipped with a special spreader which spaces the lifting hooks some distance apart and gives greater stability. The runway for the electric hoist goes on out to the end of the storage yard. Alongside this yard is a railway track to accommodate the flat cars used for transporting poles to the locations where they are needed. This track is used also for bringing in cement, sand, gravel, etc., for the mixer. The general arrangement of tracks and sheds and storage yards is shown in an accompanying sketch.

When the plant is in operation ten poles are made at a time. As the forms are removed at the end of 24 hours and used on another set of beds, this gives a capacity of ten poles a day. The force of men required is small and the operations are practically continuous with no waiting for the release of forms.



A Special Spreader Has Been Arranged for Carrying the Poles

Trackless Trolley Expansion in the Far East

Tramways of Singapore Are Being Replaced with Trolley Buses, Which Are Also Used for Extensions in Shanghai by Same Management

THE whole of the tramway system of Singapore, Malay Peninsula, is to be superseded by electric trolley buses. This will form the largest installation of this form of traction yet in existence, according to an article in the *Tramway and Railway World*. The tramway routes are 15¾ miles long. It is proposed to extend the trackless cars over 3¼ miles of additional route, giving a total of 19 miles. As the tramway tracks were in very poor condition, it was deemed advisable to adopt the trackless trolley rather than go to the expense of renewing the track.

Early in 1922 the Singapore Electric Tramways, Ltd., was in financial difficulties and only about 10 per cent of the tramcars were available for service. A receiver was appointed and arrangements were made with the Shanghai Electric Construction Company, Ltd., to finance, rehabilitate and reorganize the undertaking. This task was carried out with great rapidity and efficiency. A complete change of policy was made, fares were drastically cut and the service and speed increased. From losing at the rate of about £50,000 per year the company soon showed a gain.

The ordinance authorizing the adoption of trackless trolleys in Singapore provides that within a year the Shanghai company shall transfer the undertaking to a new company to be called the Singapore Traction Company, Ltd. The company is to pay half the cost of reconstruction of roads and may operate trolley buses, with or without one trailer to each, on 32 different routes and on any other route in Singapore after the approval in writing of the authority within whose district the route is located. Motor buses may also be run on any trolley route with the approval of the authority; also freight cars, either trolley or motor and with or without one trailer.

The construction and dimensions of the cars are subject to the approval of the local authority, but no car may be used which when fully loaded exceeds 8 tons on two axles. The accompanying illustration shows one of the new passenger cars, which is divided into first and second class compartments.

COMPETITION NOT RESTRICTED

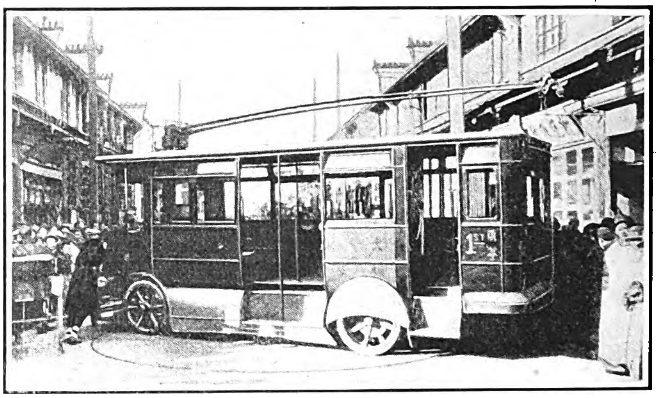
The commissioners agreed to refrain from competitive services on roads served adequately by the company. They refused, however, to undertake to restrain other competitors by restricting licenses, but as the committee thought it would be unfair to subject the company to competition from buses bearing lighter taxes it was agreed that if the total sum payable to the commissioners by any company or person operating competitive public vehicles was less than the taxes paid by the company, the taxation would be increased for such competitors.

The Singapore Traction Company has a capital stock of £400,000, divided into 200,000 preferred and 200,000 common shares at £1 each. The receiver of the old company is to be allotted 200,000 preferred and 167,000 common shares, to be appropriated in various amounts to shareholders and creditors of the old company.

The new company will be managed by the Shanghai company under a management agreement. The cost of management is to be borne by the new company, and the Shanghai company is to receive 50 per cent per year of the net profits of the new company after providing for depreciation, interest, sinking fund and any reserves approved by the Shanghai company, but before charging any British taxation.

SHANGHAI SYSTEM A GOOD EARNER

The tramway system in Shanghai is also operated by the Shanghai Electric Construction Company, Ltd., which operates the Singapore system. It is said to be proportionally the most remunerative tramway system in the world. When the tramway was opened to traffic in 1908 the total population of the foreign settlement was about 490,000. It is now about 835,000, which is an increase of 70 per cent as against an increase of only 7 per cent in the length of tramway route. Passengers carried have increased from 11,750,000 in 1909 to about 140,000,000 in 1924. The rolling stock consists of 90 motor cars, 90 trailers and fourteen trackless trolley buses. Each car runs about 30,000 miles per year. The profit has increased from $47,736 (Mexican) in 1909 to more than $1,100,000 (Mexican) in 1924, despite the increase in the depreciation of copper coinage from under 15 per cent in 1909 to over 47 per cent in 1924.



Trolley Buses in Shanghai Have to Be Reversed on a Turn Table on Account of the Narrowness of the Street

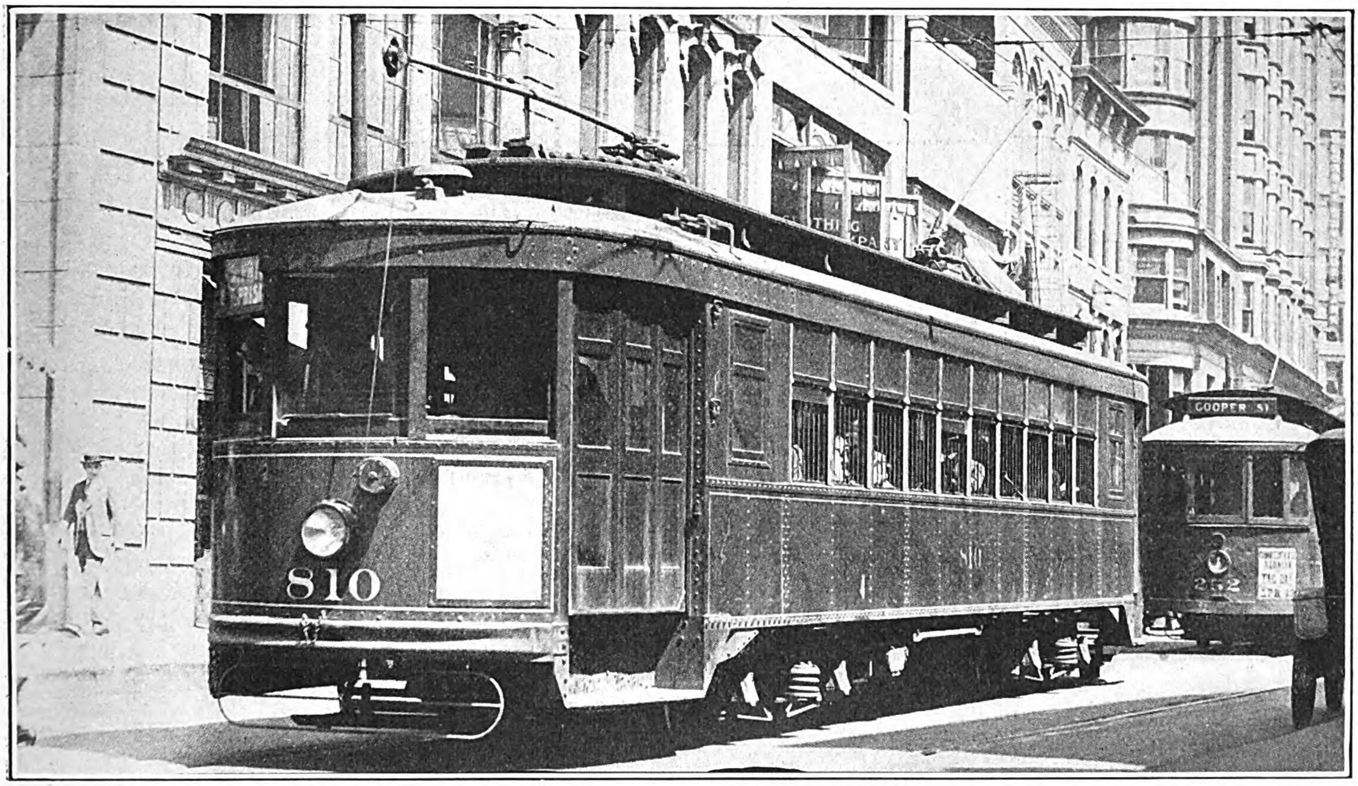
Upon approval from the Council the company may substitute trackless trolleys on any tramway route. In 1915 the company introduced trackless trolleys on a busy route 0.7 mile long. Further extensions in 1924 brought the total length of the trackless trolley routes up to 2.2 miles. Owing to the narrow streets the rail system could not be extended to any great extent, and it is thought that the trackless trolley system is the form of traction most suitable for Shanghai under the conditions prevailing there.

An agreement was entered into last year with the Municipal Council for 18.28 miles of trackless trolley extensions and 4.26 miles additional tramway construction. The company has also planned a system of electric ferries to carry trackless trolley passenger buses and freight cars across the river.

The Municipal Council recently granted licenses to an outside company to run gasoline buses. Some of these are expected to compete with the tramways and trolley buses, and it is said that they have been granted more favorable terms by the municipality than have been allowed the Shanghai company.

New Atlanta Cars Have Unusual Features

Special Rack and Lever Mechanism Is Used for Raising Windows—Sliding Doors Consist of Three Hinged Panels—Total Weight Is About 35,000 Lb.



Three-Panel Sliding Doors and Window Guards Fastened to the Lower Sash Are Features of New Cars Recently Put in Service in Atlanta

COINCIDENT with the recent passage of an ordinance abolishing jitneys in Atlanta, the Georgia Railway & Power Company placed in operation twenty new cars as a step toward improving the local transportation system. These cars were built by the Cincinnati Car Company and differ in many respects from others heretofore operated in Atlanta. In an effort to provide passenger comfort as well as utility and economy in operation several novel features were included in the design.

The over-all length of the new car is 46 ft. 2 in. This is 18 in. longer than the largest cars now in use. The ends of the vestibule are well rounded and the same curve is continued back to the body corner posts. A pleasing effect of symmetry is thus secured and also the same clearance on curves as is now obtained with shorter cars. The appearance of the new car is further enhanced by a reduction in body height between the stills and the roof and also by the use of small diameter wheels.

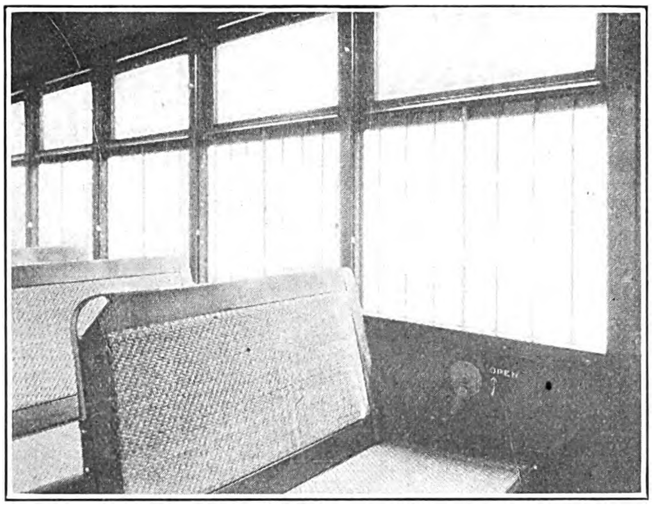
An attractive feature from the point of view of the passenger is the arrangement of windows and guards. The upper sash is stationary, while the lower sash is raised by means of a special rack and lever mechanism, enabling the passenger to open or close the window easily. Guards are an integral part of the sash, being connected to the bottom rail. When the window is closed slide into pockets, giving unobstructed vision and also facilitating window washing. When the window is raised the guards move into position automatically.

SLIDING DOORS PREFERRED BECAUSE OF NARROW STREETS

Another unusual feature of these cars is the type of sliding door used. This is made in three panels, fastened together with continuous rod hinges. It is expected that this hinge design will prevent the warping and binding which sometimes occur with wide sliding doors. The vestibule door opening is 50 in. wide. Stationary steps are used and the bottoms of the doors are equipped with aluminum guards which cover and protect the step wells when the doors are closed.

With a view to preventing accidents, sliding doors were adopted for the new cars instead of the type of folding door previously used. On account of the narrowness of many of the streets in Atlanta there is likelihood of an outside folding door catching in automobiles and other vehicles. Experience with the new sliding door has so far proved entirely satisfactory.

Platforms, steps and the adjacent street are brightly lighted by groups of five lamps placed over each vestibule door. These burn only when the doors are open. This arrangement not only prevents danger of accidents



Windows Are Raised and Lowered by a Rack and Lever Mechanism

to passengers boarding and alighting but also serves as an indication to approaching vehicles that the car has stopped.

REASONS FOR RETURN TO MONITOR ROOF

Although the last several lots of cars purchased by the Georgia Railway & Power Company were equipped with arched roofs a reversion to the monitor type was made in the new cars. This was done for two reasons. In the first place, the management believes that better ventilation is secured with a monitor roof. In the second place, it is thought that an arched roof acts to some extent as a sounding board and echoes inside the car body the various noises of operation.

Exterior painting is olive green trimmed with white. Special pressed steel bumpers, as shown in an accompanying illustration, add to the rounded appearance of the vestibules. Inside the body is finished in cherry, stained and rubbed down to a soft natural shade. Brown battleship linoleum is used on the floor, except in the aisle, which has wood wear strips. Uninterrupted passage from the platform to the car body is obtained by the elimination of closed bulkheads.

Pockets for the sliding doors extend in toward the center of the car a distance equal to the width of the longitudinal corner seats. This arrangement may be seen in an accompanying illustration.

Seating capacity is provided for 48 passengers. Seats are of wood, rattan covered. They are 34 in. wide and are spaced 29¼ in. apart. The aisle is 24¼ in. Artificial lighting is by two rows of electric lamps directly over the seats. This position for the lights is preferred because no shadows are cast on a passenger's newspaper. Twelve electric panel heaters have been installed. These are arranged to maintain a constant temperature of 56 deg.

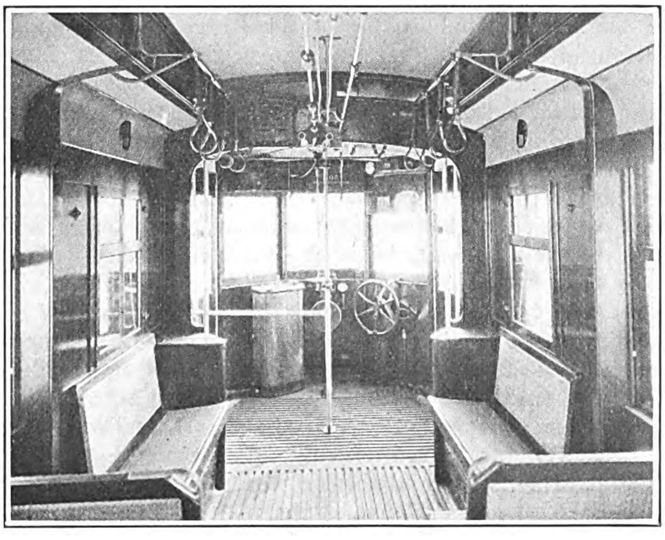
Entrance and exit are facilitated by the use of small wheels and low steps. The wheel diameter is 26 in. From the rail to the first step is 15¼ in. and from there to the platform 14¼ in. A 3¼-in. ramp has been made in the car floor. Height from rail to the underside of the sill is 28$\frac{3}{16}$ in. Inside height from the floor to headlining is 7 ft. 11⅜ in.

Electrical equipment consists of four General Electric type 265-A motors and double-end K-35JJ control. A line breaker is located underneath the car floor. The weight of the electrical equipment is 1,120 lb. and the four motors 6,340 lb. The total weight of the entire car is 35,000 lb.

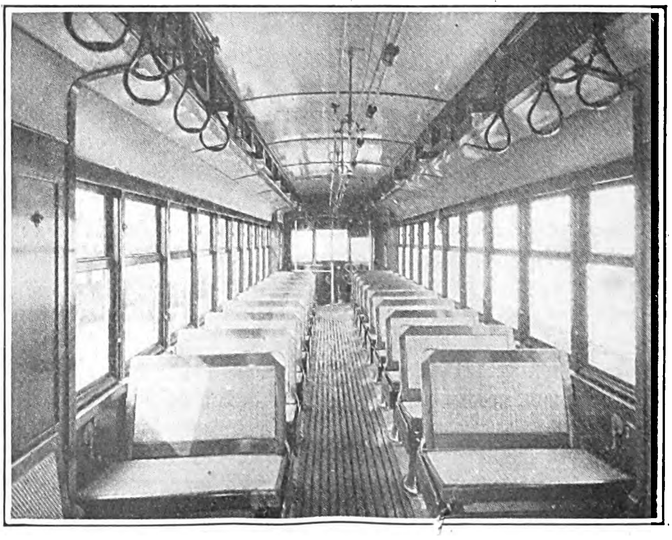
Weights and dimensions are given in the accompanying table. A few minor variations exist between the dimensions of the finished car and the specifications published in ELECTRIC RAILWAY JOURNAL March 28. At that time a list of equipment used on the cars was given.

PRINCIPAL WEIGHTS AND DIMENSIONS
OF NEW ATLANTA CARS

Weights:	
Car body	16,695 lb.
Trucks	9,360 lb.
Motors	6,340 lb.
Electrical equipment	1,120 lb.
Air brake equipment	1,485 lb.
Total	35,000 lb.
Length over all	46 ft. 2 in.
Length over dashers	45 ft. 4 in.
Length of body	33 ft. 2 in.
Length of platforms	6 ft. 1 in.
Length truck centers	20 ft. 6 in.
Truck wheelbase	5 ft. 0 in.
Height rail to top of trolley board	11 ft. 2$\frac{13}{16}$ in.
Width over all	8 ft. 3⅝ in.
Width at side sill	8 ft. 1 in.
Width over vestibule corner posts	6 ft. 9 in.



Steel Semi-Bulkheads Extend into the Car a Distance Equal to the Width of Longitudinal Seat



Artificial Illumination Is Provided by Two Rows of Electric Lights Directly Over the Seats

The Readers' Forum

Welding and Boring Cost Less than New Bearings

April 29, 1925.

To the Editor:

I have read with a great deal of interest your editorial entitled "Repair Equipment Parts Before Excessive Wear Occurs." Your paper has also published a number of exceedingly interesting articles along these same lines in regard to methods pursued by the different railroads in connection with bearings, housings, axle caps and motor frames. Is it not about time to emphasize more strongly the importance of welding and boring? It is possible to point out from actual figures the low cost of this work so that a certain standard can be followed by the railroads in general, as very often the master mechanic of a smaller property is able to have his manager approve expenses if these are along the lines of standardization as adopted by the association or the largest railroads.

In my opinion many master mechanics would be surprised to learn how cheaply welding and boring can be done if they would look into the matter carefully. In fact, I know of a number of roads that have bored several thousand motors. Figures from these companies show that the welding and boring does not cost as much as one set of new bearings, four in number. Shimming should not be referred to as poor shop practice, or as no longer necessary; it should be outlawed and never should have existed, for reasons readily appreciated if a mechanical man gives serious consideration to them. Why is it the railways always can find enough money to purchase new bearings which are put in old frames or heads and quickly ruined, and cannot find sufficient money to weld and bore?

Although some railways keep a record of the pressure necessary to insert bearings in the armature heads and check the clearance between gears and pinions after bearings are worn, still few follow up the matter so as to obtain beneficial results.

AN EX-MASTER MECHANIC.

Age-Life Method of Valuation Deals with Averages

MINNEAPOLIS, MINN., April 8, 1925.

To the Editor:

Your editorial of April 4 commenting on the three recent valuation decisions in Denver, Duluth and the Twin Cities ends by hoping that they will "establish additional precedents leading to more accurate statements by consultants of this class," referring to the cities' consultants.

As one of the bases for criticism you refer to the treatment of track by the consultant for the city of Denver, stating that the value of some of it "was listed as less than zero, and subtracted from the total of the remaining property." This, of course, is not true.

Briefly, the situation was this. The city used, as a basis for its calculation of accrued depreciation on the age-life method, a certain life for all track in the city. It so happened that there were a number of instances of lightly used track where the age had exceeded this average estimated life, which of course is a situation always to be expected when averages are used. The company's expert, in his jealous desire to pick flaws in the city's case, capitalized this to the extent of presenting an elaborate exhibit showing that these particular stretches of track, if calculated separately on the basis of their individual ages and the average life assured for all track, would then stand in the city's appraisal at a depreciated value less than zero. The futility of this exhibit was immediately noted by the master hearing the case, who stated that if the life used was correct, an exhibit showing cases where the condition calculated on this basis was too high could just as effectually be set up.

This defect in the city's case, if it was defect, is inherent in every instance where averages have ever been taken as a basis for any calculation. Similar criticism could be made of both the city's and the company's appraisals of track in the matter of unit costs, as in each appraisal the same average unit costs per track foot for the same type of track were used whether the track was located in the congested downtown section or the outlying sections of the city, where the labor cost of installing would be considerably less.

The reference to "more accurate statements" is well taken, but, as is often the case, should be applied both ways.

H. S. LANGLAND,
Engineer.

New Interstate Commerce Statistics

STATISTICS of the interstate railways of the United States for the year ended Dec. 31, 1923, have just been made public by the Interstate Commerce Commission. Some of the more significant follow:

STATISTICS FOR 1923,
INTERSTATE COMMERCE COMMISSION

Miles of track owned by Class I companies	278,915
Miles of track operated by Class I companies	385,855
Number of steam locomotives in service Dec. 31, 1923, all companies	69,005
Number of electric locomotives in service Dec. 31, 1923, all companies	409
Number of freight cars in service Dec. 31, 1923, all companies	2,410,007
Number of passenger cars in service Dec. 31, 1923, all companies	57,159
Number of company service equipment in service Dec. 31, 1923, all companies	112,426
Number of passengers carried, all companies	1,008,537,863
Number of passenger-miles, all companies	35,294,178,000
Number of passenger train-miles, all companies	573,938,043
Number of passenger train car-miles, all companies	3,616,342,000
Average journey per passenger in miles	37.97

Bill for Railway Policemen Disapproved

GOVERNOR SMITH on April 23 vetoed the Thayer bill amending Section 88 of the railroad law, authorizing superintendent of state police to appoint railway policemen on request of express companies and electric railways. This measure was strongly opposed by the State Federation of Labor and the railway workers. It was requested by the American Railway Express Company.

The Governor approved as Chapter 684 of the Laws of 1925 the Nicoll bill amending the New York City rapid transit act authorizing the sale of magazines, books, flowers and confectionery and the advertisement thereof in subways.

Association News & Discussions

Rail Welding the Topic at American Welding Society Meeting

Symposium by Electric Railway Engineers Is Devoted to Discussion of Methods in Use on Various Properties—New Officers Elected

ELECTRIC railway subjects featured the annual meeting of the American Welding Society, held in the Engineering Societies Building, New York City, April 22 to 24. The morning of Wednesday was devoted to meetings of the resistance welding and gas welding committees. In the afternoon the electric arc welding committee met and in the evening the educational committee discussed plans and ways and means for carrying them out.

On Thursday morning the annual business meeting was held. It included the usual reports and the announcement of the election of officers, as follows: A. G. Oehler, New York, president; George Bird, Atlanta, and C. S. Smith, San Francisco, vice-presidents; James Burke, Erie; Joseph Meadowcroft, Philadelphia; S. W. Miller, New York, and H. A. Woofter, Lynn, Mass., directors-at-large.

The fourth annual dinner of the society was staged at the Park Avenue Hotel Thursday evening and was attended by more than 100 members and guests. T. A. Wry of the General Electric Company, vice-president of the society, acted as toastmaster.

Friday, from 9:30 o'clock in the morning until 2 o'clock in the afternoon, was given over to the technical session of the meeting. It consisted of a symposium on two subjects, "Methods of Inspecting Welds" and "Testing the Skill of Operators." Short papers were offered by about 30 experts in the different branches of welding. Abstracts of some of those relating to welding of rail joints follow:

Rail Joint Welding on Eastern Massachusetts

By **Frank B. Walker**

Chief Engineer Eastern Massachusetts Street Railway

THIS discussion only treats of two points, namely:

1. Training of welders.
2. Inspection of finished work.

Whatever measure of success we have had with the metallic arc process of welding has been due to what we are pleased to call the development of the technique of welding. When we began this process, in 1921, we hired an exceptionally good welder to act as a welding instructor and began the training of picked, green men.

Due to the volume of work and the press of time, we also hired experienced welders, whenever possible. However, probably 90 per cent of all our men were trained by our own instructor and were invariably better men than the so-called "experienced men" who came looking for positions.

In picking the applicant for training, we were particular that he be young, or at least not so old but that he was still mentally and physically flexible, was in good physical condition, possessing both hands and feet, as well as good eyesight and hearing.

The trainee was first taught the difference between the two general types of welding machines, i.e., resistance and motor generator or dynamotor type, the class of work done by each and why; the polarity of the welding arc of each type, and in the case of the motor-generator machine, how to change the polarity of the arc.

He was also taught the rudiments of the care and operation of the two types of machines, paying attention to the importance of cleanliness and lubrication, and with due emphasis on the fact that in starting a machine correctly the last thing done is to apply the power, while in stopping a machine the first thing that should be done is to shut off the power.

In addition to the above, the operator was continually importuned to develop (if he did not already possess it) a sense of pride in the appearance and quality of the work he was doing as well as the appearance and condition of the machine he was working with, and last but not least a sense of responsibility for "safety first" as it applied to himself, the workmen busy around him and the public at large.

When it came to the actual handling of the electric arc, the two essentials of metallic arc welding, viz.: absolute cleanliness of all welding surfaces and the use of a short arc, were continually emphasized and held up before the operator, as the observance, or lack of observance of these two points, spell success or failure in this type of welding.

For our type of work the actual training of the men consisted of intensive training in a few simple exercises, as for example:

1. Striking the arc without sticking the electrode and breaking the arc without causing a deep, spongy, oxidized crater.
2. Welding parallel beads in a flat position.
3. Filling in the space between parallel beads by depositing a half-moon bead. We do not allow the use of the straight or "inch-for-inch" bead.
4. Building up a pad of metal 3 in. x 6 in. x 1 in. in height in the flat position.

After the trainee became proficient in the above exercises, he repeated them on a flat plate, in the vertical position.

The last step was a repetition of these exercises on a flat plate in a straight overhead position.

The trainee was shown by observing the shape and color of resulting beads whether or not his arc was of proper length and whether the voltage or current gave the correct heat.

Our system of inspection as finally developed practically made certain that every operator's work was under continuous inspection.

In the first place each welder was supplied with a stencil number which he stamped on each joint welded. These numbers were, of course, recorded so that any one interested could tell immediately the operator doing the work. This practice gave the operator a sense of responsibility and had a tendency to do away with carelessness on his part.

To further check up the operator's work it is our practice for the foreman in charge of the track job to test out at least one joint of each operator's day's work, the usual practice being to inspect all the joints, picking out those which are at all questionable, so far as appearances are concerned, and then trying to break them off by means of a hammer and wedge.

Then, of course, there was the continual inspection by the welding engineer and welding instructor. These men were in communication every day, and arranged that between them all welding jobs were covered by one or the other every three or four days. This work being scattered over 640 miles of track, it required 50,000 miles of traveling a year on the part of these men.

In addition, a winter track school was held, which was attended by all engineers, managers, superintendents, roadmasters and track foremen. Among other subjects, track welding and bonding were thoroughly discussed by means of an illustrated talk. The various important points, such as the absolute necessity of clean welding surfaces and the use of a short arc, were illustrated with lantern slides, showing the appearance and quality of the finished work, using the short arc and also using a long arc. The distinguishing marks being very definite, that once learned, our supervisory force did not need to be welding experts to tell from a finished bead whether the operator used a short or long arc, or used the proper amount of current. The welding instruction was in two parts, viz.: the illustrated talk and discussion in the morning and the practical application in the afternoon. In the afternoon, all those attending the lecture were taken in hand by experienced welders and actually taught the rudiments of handling the arc. Of course, they did not become finished welders or even good welders, but they did acquire considerable beneficial knowledge and experience, which helped greatly toward the success of our joint welding.

The one outstanding point of all the various inspections was, and still is, that if a joint for any reason did not look A-1, it was broken open, and if they all looked good one or two were broken open anyway. This is rather rough treatment, but it does tell absolutely just how good a finished job we are getting. If there is any criticism or suggestion to make, we have the man's number on the joint to refer to. He is brought back and the points under criticism shown him, and if necessary he is given help to correct his fault.

This method of inspection was a big help in weeding out those welders who could not or would not learn to weld as we desired, for after a man had been thoroughly instructed and then had been checked up three or four times by means of broken joints, without showing any improvement, he was discharged.

The above methods of instruction and inspection, which so far as we can ascertain no other road has ever attempted, have made possible the welding and rehabilitation of many miles of worn-out open and paved track which otherwise would have had to be rebuilt with new rail.

Our proportion of weld failures is about one-tenth of 1 per cent per year.

COMING MEETINGS

OF

Electric Railway and Allied Associations

May 8—**Metropolitan Section, A.E.R.A., Engineering Societies Building, New York, 8 P. M.**

May 12-13—**Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.**

May 14-16—**Massachusetts Safety Conference, Copley Plaza Hotel, Boston.**

May 19-22—**Chamber of Commerce of the United States, annual meeting, Washington, D. C.**

May 20-21—**Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.**

May 25-28—**National Association of Purchasing Agents, Milwaukee, Wis.**

May 27-28—**Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.**

June 2-4—**Central Electric Railway Association, French Lick Springs, Ind.**

June 3—**Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

June 3-4—**Iowa Electric Railway Association, Waterloo, Iowa.**

June 10-12—**Canadian Electric Railway Association, Montreal, Quebec.**

June 26-27—**New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

July 22-25—**Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

Oct. 5-9—**American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

Boston Welding Practice

BY H. M. STEWARD

Superintendent of Maintenance
Boston Elevated Railway

THE rail ends are milled square laterally and have an undercutting of 1/64 in. in 12 in. Joint plates are of rolled section of medium carbon steel with a carbon content of 0.30 to 0.40 per cent.

The drift pin method of joint assembling is used whereby the rail heads are brought under moderate compression. Between the rail heads we place a soft steel insert 1/16 in. in thickness. This insert projects ⅛ in. above the running surface of the rail and after the joint is welded the insert is peened over and the joint ground off by a small reciprocating track grinder. Rail joint base plates are used and are welded to base of the rails. The joints are welded by the carbon arc process "B" method of seam welding. The welding rod used is 3/32 in. in diameter by 24 in. in length, of the following chemical composition:

	Per Cent
Carbon	0.12
Manganese	0.41
Phosphorus	0.009
Sulphur	0.050
Silicon	0.07
Chromium	0.06

The rods are flux coated. About 1½ in. of welding rod is used per inch of seam. The top seams are double welded for part of the distance. The seams are preheated and postheated by means of the carbon arc. This is done by drawing as long an arc as possible and moving it slowly along the seam.

The welding current varies from 175 to 200 amp. at 25 to 30 volts. The length of the arc is approximately ⅜ in. A welding crew consists of two men per machine. Only one man welds at a time. The operators relieve each other at intervals.

Before men are assigned to regular joint welding they first receive instruction in the care and operation of welding machines and make up test joints under the direction of competent instructors. These test joints are broken apart that the men may see the effect of the welding. When the men are considered competent to weld joints they are assigned to one of the regular crews for further instruction and, if they pass the final test, take their place as regular welding operators. The Boston Elevated Railway has no means at its own disposal of testing any joints other than by the destruction method, and this is done occasionally by the operators.

From time to time, however, full-sized joints or shorter test specimens are carefully and scientifically tested at either the laboratory of the Rail Welding & Bonding Company at Cleveland, Ohio, or at the Massachusetts Institute of Technology. In addition to these tests the results obtained by various methods of welding, variation in strength of current used, welding rods of different composition or of test sizes, etc., are tested by our chemists, Saunders & Franklin of Providence, R. I. These tests consist of chemical determinations and micro-photographs to study changes in the structure of the rail metal, joint metal and welding metal.

A careful and vigilant inspection of welding is made by the welding foremen during the welding and after the job is finished.

Carbon Arc Welding on Chicago Surface Lines

BY JONATHON WOLFE

Assistant Superintendent Track and
Roadway, Chicago Surface Lines

FOR the ten or twelve years prior to 1907 practically all rail joints of the Chicago Surface Lines were cast welded. In 1907 the use of the Lorain electric bar weld (a resistance weld applied under a hydraulic pressure of about 45 tons) was begun, except that in the southern section of the city cast welds were continued until 1914. A total of approximately 183,500 Lorain bar welds were welded under contract by them, not including free reclamations.

A chart made of 175,000 joints, covering from one to ten years of service, showed less than 1 per cent total breaks per year.

A few thermit welds of the old non-insert type were installed in 1911 for experimental purposes. During 1915 approximately 500 thermit welds of the insert type were installed and last year we installed 643 additional insert thermit welds on several of our extensions.

Seam welding of rail joints by the carbon arc process was begun in February, 1919, and 905 joints were welded during the first year. With the many improvements developed in this process since that time we have continued to use seam welds and have installed more than 45,000 joints to date. There are now nine equipments in daily service, used both for joint welding and for spot welding worn special trackwork. Three additional type WW equipments have been purchased and are being put into service.

The seam weld has proved particularly fitted for the reclamation of the scattered broken joints. The work can be done during the daytime, when better inspection of the work can be made; there is no need for the installation of temporary crossovers, and car operation is interfered with very slightly, cars being permitted to pass over the joints after completion of each seam. Considering that rails ranging from new to those almost worn out have been seam welded our proportion of failures is quite low.

Inspection of seam welds is an extremely important factor if uniformly good results are to be secured, and unless the welding operators have been thoroughly instructed until they follow the rulings and approved methods of welding the joints will certainly not hold up as long as they should. With Lorain bar welds, which were welded under contract, and with the thermit joints, the principal part of which consists of a chemical reaction, the inspection is much simpler, as there are fewer variables which can affect the quality of the weld.

Of primary importance in securing a good joint is the preparation of the joint before welding is begun. The ties must be firmly imbedded in the track foundation and the rails fastened securely to the ties so there is no movement in either ties or rails. With the best possible welds, using the toughest electrodes available, the number of failures will be much greater if the rail ends are working up and down under the passing cars, as the weld would be subjected to alternate strains that must eventually crystallize and crack the seams.

Welding plates must be made so as to fish perfectly with the rails—we are using practically all machined plates—and where plates must be upset to connect with worn rails or rails worn different amounts, the corner is planed square so that the worn rail having the thinner head will be supported to the end of the rail.

To determine the proper size of the joint plates for seam welded joints with various girder rail sections, no information of this nature being available, we followed these general rules shortly after beginning the use of this process:

1. The cross-sectional area of the two bars at the joint should at least equal the cross-sectional area of the rail to be welded.

2. The combined lengthwise sectional area of the four welding seams on either side of the rail joint (assuming $\frac{1}{4}$-in. penetration) should equal the cross-sectional area of the rail to be welded.

Care must be taken that the plates are put on the joint properly so that they will be vertical and the sloped edges engage the head and base of the rails evenly. The bolts must be installed and tightened as far as they will turn without stretching. All joint plates and rail ends, whether new or old, should be vigorously brushed with a stiff wire brush and, if necessary, cleaned with a file and chisel. Where compressed air is available, I would recommend the use of a portable sand blast for cleaning both rail ends and plates. Any rust, scale, concrete or dirt in or along the seams to be welded will not only lessen the depth of penetration and form inclusions that may start seam cracking, but may keep the plates from having a good mechanical fit and thereby introduce additional strains in the joint.

Rail ends should be tightly butted together and under compression before welding is started. Where possible this should be accomplished without the use of insert shims; on new construction work the rails can usually be driven back by using wedges in the joint ahead. On reclamation work the cut-in piece may be installed at lower temperatures than when welding is done, in which case the ends are usually so tight that no insert can be inserted. We carry inserts in stock and with each welding equipment. These vary in thickness from $\frac{1}{32}$ in. up to $\frac{3}{8}$ in. and to conform in section to the heads of our standard rails, and 1-in. x 2-in. shims for odd rails. Where there is any opening between the rail ends which cannot be closed otherwise, we drive in the largest single shim required to give a tight joint, first driving temporary wedges under the bases of the rails to widen the top part of the opening. More than one insert is not used at a joint if possible to avoid it.

We have found that joints of the same kind welded in cooler weather have held up better than those welded in hot weather. Our latest practice on new construction or on rail renewals is to weld at night or during the early morning when the rails are laid in the warmer months, thus both securing compression at the rail ends and lessening temperature strains during cold weather.

When the joint has been properly prepared and inspected by the operator, welding of the seams is started. Our standard welding gang consists of five or six men, depending on the density of car and vehicular traffic. The welding operator and two helpers are with the welding machine, one helper taking care of the pole hooking onto the trolley wire and watching traffic. The other helper supplies the operator with welding electrodes and sharpened carbons, watches the machine and takes care of the welding screen. Where traffic is very heavy an extra man is used as a watchman. A grinder operator and one helper run the Atlas rail grinding machine, with which all joints are ground to a smooth surface. A four-wheel rubber-tired trailer is used for transporting the equipment, the welding machine being mounted on one end, the tool box on the other and in the middle, which is depressed, is space for carrying the Atlas grinder.

The upper seams are welded to within 2 in. of the ends of the plates, the lower to within 1 in. or less. The so-called "AA" method is used, with a double seam on the middle 8 in. of the upper seam and a gap of 6 in. left unwelded on the lower seams, with about 3 in. of double seam each side of the gap. The amperage used varies from 275 to 325, depending on conditions at the joint. The exact adjustment of the resistances is left to the judgment of the operator, who determines by the way the electrodes flow when he has the correct adjustment. The length of arc used is about $\frac{3}{8}$ in.

A large percentage of the joints welded on reclamation work are upset various amounts, and as these plates are made with $\frac{1}{8}$-in. variations in the upset, it frequently happens that there is a considerable difference in the height of the rail ends when the joint is prepared and ready to weld. We have found that the pounding of the cars over these joints while the different seams are being welded and before surface welding with high carbon is likely to start seam cracks. Therefore, whenever there is any pronounced difference in the rail end heights, we build up the top surface of the joints with high carbon electrodes, using the metallic arc process, and grind the joint before starting the seam welding. After the seams are welded we again grind the joint slightly to make sure that the finished joint has a smooth, even top surface.

For the inspection of the finished joints we have built up from experience a method which is satisfactory and has resulted in greatly improving the quality of the joints.

We have conducted tests at different times to determine the proper kind of electrodes. Welds were made on mild steel plates and tested mechanically and chemically. For several years we used the American Bureau of Welding Specification E-No. 1-A for low carbon electrodes. This specification, which was made primarily for metallic process shop work, is not sufficiently rigid in my opinion for the requirements of a welded rail joint, subjected to the continual shock and vibration of passing car wheels, where ductility is so all important. I mean ductility or toughness that will continue for the life of the rail and not permit crystallization of the weld to cause the seam to fail before the rail is worn out. For the last year we have used the coated low carbon electrodes (grade 200) having a manganese content around 1 per cent, and are getting a better, tougher seam than before.

There are some simple tests which can be used to advantage by the individual street railways in determining ductility of the seams, etc. To what extent such tests are used will depend on the viewpoint of the particular railway. The following are just a few tests that, while not new, are simple, easily made and give comparative results for determining proper grades of electrodes:

(a) Weld together two "V" pieces of mild steel, subjecting both parent metal and the weld to mechanical, microscopic and chemical tests covering structure, hardness, composition, etc.

(b) Weld at right angles to each other two plates of mild steel, place one in a vise and determine to what angle the other plate can be bent before fracture occurs.

(c) Weld upper seams of sections of welding plates to the head of standard rails, the plates being fished into the rail. The amount of pull necessary to bend the plate out from the rail until fracture occurs and the angle at which fracture occurs can then be determined.

Our experience has indicated that with bare electrodes a better weld is secured by using flux, and instructions to the operators require its use. We use the powdered flux furnished by the Rail Welding & Bonding Company. One advantage of the coated electrode is that the flux is furnished in uniform quantities.

We hold meetings at which all division superintendents, welding foremen and welding operators are present, and at some of these meetings have samples of welds, test pieces, etc. In the discussions which follow many good points are brought out, instructions are issued covering future work and the operators brought in touch with each other's work.

Methods used for testing the skill of the operators are somewhat involved with the course of training for operators, and our practice is considerably different from that commonly in use for shop work owing to the difference in the nature of the welding done.

The skill of the operators is mainly checked by inspection of the welding done by them and by the way in which their joints hold up under service in the track. Each operator has a metal stamping die with an individual letter with which he must stamp every joint welded by him, and it is usually possible to identify any particular joint. It is comparatively easy to judge the quality of seam welding by visual inspection, as poor work shows up very plainly in uneven and ragged seams, burnt metal or deep holes in the seams. We also rely to a large extent on the meetings, previously mentioned, which are held in our office at stated intervals. Here are brought up criticisms of any welding being done, with samples of such work shown, and means to correct faults brought out through discussion.

Welding in Washington

By R. H. Dalgleish

Chief Engineer the Capital Traction Company

TWO methods of electric welding are now used quite extensively for welded rail joints, the metal electrode and the carbon electrode methods. The welder on this class of work is at a great disadvantage in that he is necessarily in an uncomfortable position, disturbed by vehicular traffic, and on a majority of jobs he is interrupted by passing cars. This has a tendency to distract the welder from his work and makes it very hard for him to keep his mind on what he is doing. A good welder on shop work is often unable to do good work on rail joints in the street, so it is necessary to use great care in teaching them how to do this work. Welders are first taught to weld in the shop in the position required in the street. This is done to get them used to this method before subjecting them to the traffic distraction. They are then sent out with an experienced welder until they are able to work by themselves.

When preparing rail joints for welding, the rails are first cleaned of all scale, rust and grease, as are also the joint plates. The plates are then bolted to the rails and the rails carefully lined up to get the gage line straight and the joint even at the top. After welding, the rail head is ground with a reciprocating grinder in order that there will be no uneven joint for the wheel to come in contact with.

The ends of the rails should be carefully cut to make a tight joint before the plates are welded to the rails. In order to insure tight joints between rails, the spacing of the holes in the rails is slightly greater than in the plates and drift pins are driven in to draw the rails together before welding. The heat from the welding, of course, tends to expand the rail and draws the joints up still tighter.

The welding is started on the outside top seam and next the inside bottom seam; next inside top seam and last outside bottom seam. This distributes the heat somewhat and has proved to be quite satisfactory, although I am sure that welding the seams in another order will be satisfactory so long as both seams are not welded on one side of the rail before any welding is done on the other. When this is done, it tends to kink the rail.

A $\frac{3}{16}$-in. rod of low carbon steel is used for metal electrode welding, with 125 amp. at 60 volts, about $\frac{1}{8}$-in. arc.

After welding, inspection should be made of alignment of rails to see that the gage line is straight. The weld metal should be laid on in even layers and the uniform corrugations will show the metal deposited evenly. Examination should be made for burned spots in the seam. An examination of the seam should be made to see that the metal is evenly placed on both plate and rail, in order that the maximum strength may be developed at the joints. When rail is welded in one length $\frac{1}{2}$ mile or more long, the joint is subjected to severe tensile stress, in addition to the vibration set up in the rail due to the movement of cars over the rail. This requires careful work and inspection to prevent failures.

With the carbon arc method of rail joint welding, the skill of the welder is the predominating factor, and the difficulty in getting welders who will turn out uniform work makes it very difficult to get satisfactory results. We have had so much difficulty getting uniform results with the carbon arc method that we have discontinued the use of that type of joint and we are now using metal electrode welding for all seam-welded rail joints.

After welding with the carbon arc method, it is almost imposible for an inspector to eliminate the bad joints due to the uneven deposit of metal and the fact that on practically all joints burned spots may be found which may or may not be burned metal. In preparing joints for carbon arc welding, the plates and rail are treated in the same manner as in metal electrode welding. A deflector bar is used to deflect the metal into the seam. In some cases a $\frac{9}{32}$-in. rod of mild steel is laid in the seam and burned in place by the carbon arc. Another method is to hold a $\frac{9}{32}$-in. rod in the left hand and the carbon pencil in the right hand and thus burn the metal into the seam.

A long arc with 275 to 300 amp. at 60 volts is used for this class of work, and with that much current it is important that the arcs be moved at a uniform rate of speed to prevent burning the metal. The average cost of this type of joint is as follows:

COST OF ONE ARC-WELDED JOINT

Joint plates, 1 pr.	$2.90
Welding rod, 1.8 lb.	.26
Carbon pencil	.05
Royalty	1.00
Welder, one hour	.75
Helper, one hour	.50
	$5.46

Central Traffic Association to Meet May 20-21

SEVERAL important items will be presented at the next regular meeting of the Central Electric Traffic Association, which will be held in the Tuller Hotel, Detroit, Mich., on May 20 and 21, beginning at 9:30 a.m. The first day's session will be in the nature of a round-table discussion, followed by committee meetings. The second day will be devoted to reports of committees and such other business as may be presented.

American Association News

Unification of Car Design

PROGRESS was reported at a meeting of the committee on unification of car design of the Engineering Association which was held in the Illinois Merchants Bank Building, Chicago, on April 23. Those present included H. H. Adams, chairman; G. L. Kippenberger, W. F. Graves, Charles Gordon and L. C. Sparks representing V. Willoughby.

It was the opinion of those present that the work of the committee should be devoted to the collection of fundamental facts and information which would tend to stimulate greater uniformity in basic car dimensions rather than to the development of any uniform design of car. The committee felt that the dimensions adopted in its previous reports establish a foundation and that it is not advisable to carry this process further until there is more general acceptance by the industry of the dimensions proposed, or until these basic dimensions can be revised so as to be acceptable.

For this reason, it was held that the immediate work of the committee should consist of the collection of data to determine the limiting clearances which fix the dimensions of cars used on various properties. Mr. Graves said that the way committee collected considerable data on track centers and minimum radii on various properties, and volunteered to look this matter up and furnish the chairman with this data. Mr. Kippenberger pointed out that the lack of available information on limiting clearance dimensions was a serious handicap in the attempt to develop any form of car which could be used on a large number of properties.

The committee felt that this clearance data would enable it to determine the proportion of properties that could use cars of uniform dimensions, and that this would be a valuable guide to the car builders in the design of cars that could be manufactured on a production basis at considerable saving in cost.

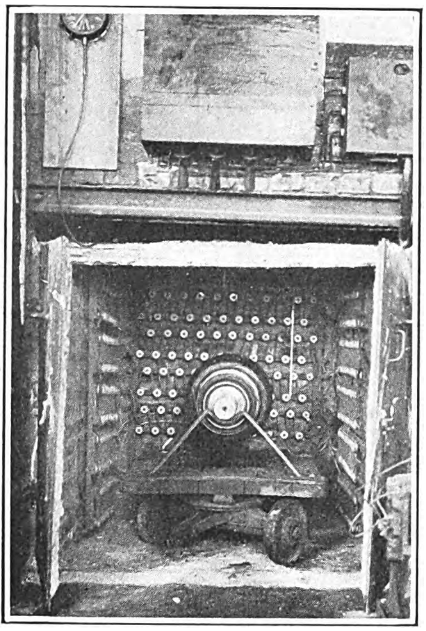
As the first step in this program, those members of the committee representing car builders will be asked by the chairman to compile a list of the clearance data which should be collected from various properties to determine the limiting dimensions of cars.

A motion picture, illustrating car building methods of the Chicago Surface Lines, was shown to the committee to determine whether it should be exhibited at the time of presentation of the report at the annual convention as an illustration of the savings in construction costs which are made possible by uniformity in design.

Maintenance of Equipment

Car Heaters Used in Small Baking Ovens

DIPPING and baking of armatures is done by the Milford & Uxbridge Street Railway in a small plant recently built at its shop, Milford, Mass. As this company is comparatively small and as it has but few armatures which require dipping and baking treatment, it was decided to construct a home-made plant rather than to purchase one from a manufacturer. In the past somewhere from 24 to 48 armatures have been rewound annually in these shops. It is expected that this number will be reduced materially in the future.



Home-Made Baking Oven Built Under the Carhouse Floor by the Milford & Uxbridge Street Railway

The floor of the armature room in the Milford shop is about 5 ft. below the floor of the adjoining carhouse. It was possible, therefore, to knock a hole through the wall between the two buildings and to construct a brick baking oven under the carhouse floor. Old electric car heaters are used. Doors are of steel, asbestos lined. The control is manual with three electric switches, each connected to one bank of heaters. The switches are located in a box immediately above the oven door, as shown in the illustration. An electric indicating thermometer shows the temperature in the oven. It is planned later to connect up this apparatus as a thermostat to give automatic temperature control.

Dipping is done in an old air tank sunk into the floor in front of the baking oven. An overhead crane and chain hoist are used for handling the armatures. All three sets of heaters are used to heat up the armature before dipping. Under these circumstances the power needed is about 15 kw. After the armature has been heated and dipped the temperature is maintained by the use of only one set of heaters or at the rate of about 5 kw. The entire operation of baking requires from eight to ten hours, during which time about 40 to 50 kw.-hr. power is used.

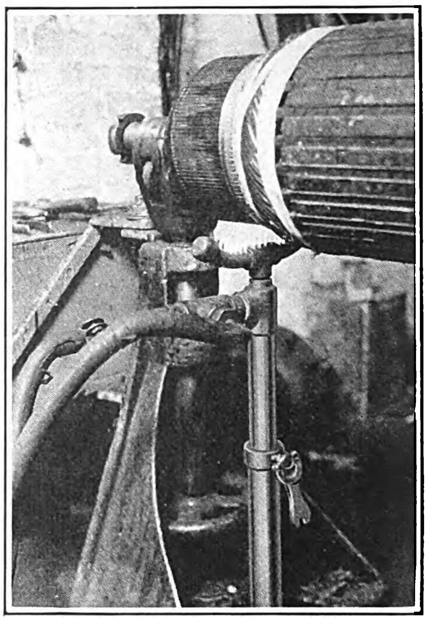
Respirator Used with Spray Painting

CAR BODIES are spray painted in the shops of the Department of Street Railways, Detroit, Mich. To facilitate the painting, the window guards are removed and the windows are either raised or taken out entirely. As a protection against the breathing of paint fumes, each painter is supplied with a Covers patent respirator. This overcomes any objection to the use of spray painting as being injurious to the workman.

For Use with the Spray Painting Method for Detroit Cars a Respirator Protects the Workman

Preheating Commutators Reduces Time to Solder

HAND soldering of armature leads to the commutator is used in the 65th Street shops of the Third Avenue Railway, New York, inasmuch as the amount of this work is rather small. The time of soldering an armature of average size has been reduced from 1½ hours to ¾ hour by preheating the commutator previous to soldering.

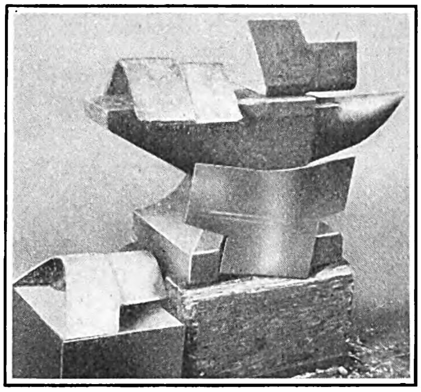


Preheating a Commutator Previous to Soldering Is Made Easy by Means of a Shop-Constructed Gas Burner

The apparatus employed consists of a pipe framework for conducting the gas and air used for heating to a curved burner. The burner is made of ½-in. pipe with the ends bent upward and with a row of $\frac{3}{32}$-in. holes along the top. Standard pipe caps are used to close the ends of the pipe and a T-connection at the center serves as a support. Gas and air are brought to a T in the upright connection through a flexible hose, which is of sufficient length to reach from the wall to the various winding stations in the armature room. The lower part of the upright pipe, which is fastened to the burner, slides in a larger pipe, so that the height is adjustable. The larger pipe is bolted to three sheet-steel legs approximately ¼ in. thick, which are sharp at the bottom to prevent slipping. After the height of the burner is adjusted to suit the diameter of the commutator to be soldered, the inside pipe is clamped in position by means of a hand screw. Shut-off cocks installed in the pipe line regulate both the air and gas supply.

Convenient Form for Bending Corner-Post Irons

CORNER-POST irons which fit at the upper corners of the bulkhead on cars of the Eighth Avenue Railroad, New York City, are of very irregular shape. They have an offset along the surface as well as being bent to go around the corner posts. No. 12 gage sheet steel is used. In bending it a special form and pattern are used. The sheets are first cut to the desired shape by use of the pattern and then after heating in the forge they are lined up on the form and bent to the desired shape in the forge shop. This method insures that all corner-post irons are interchangeable and also facilitates their being made up in quantities, which further reduces the cost and enables them to be made during slack hours.



Form and Pattern for Bending Corner-Post Irons

The form for bending is shown on the anvil and the pattern labeled "sample" rests against the anvil. A partly completed corner-post iron is shown at one end of the anvil and a completed iron on the box at the end of the anvil.

Maintenance Practices on the New York State Railways

Slotter Combined with Banding Lathe

COMMUTATOR slotting and banding can be done without removing the armature from the lathe in the Utica Park shops of the New York State Railways through the use of a slotter that has been added to the banding lathe. The commutator slotter pivots about a vertical post. Thus it can be swung out of the way quickly so as not to interfere with banding.

The saw for commutator slotting is mounted on one end of an arbor with a pulley at the opposite end. The two bearings in the block supporting the arbor are made particularly heavy and long to insure rigidity. The block supporting the arbor is fastened to a carriage, which moves back and forth on two 1¼-in. round rods. At one end the rods are fastened to a large block, which serves as the central support and pivots about its vertical bearing. The other ends of the rods are fastened to a cross plate. The carriage is moved back and forth by means of an adjusting screw acting on a nut in the carriage. Rotation of the screw by means of the handle at the right moves the carriage.

The block shown at the left of the device, which forms the main support for the slotter, can be raised or lowered by means of an adjusting screw.

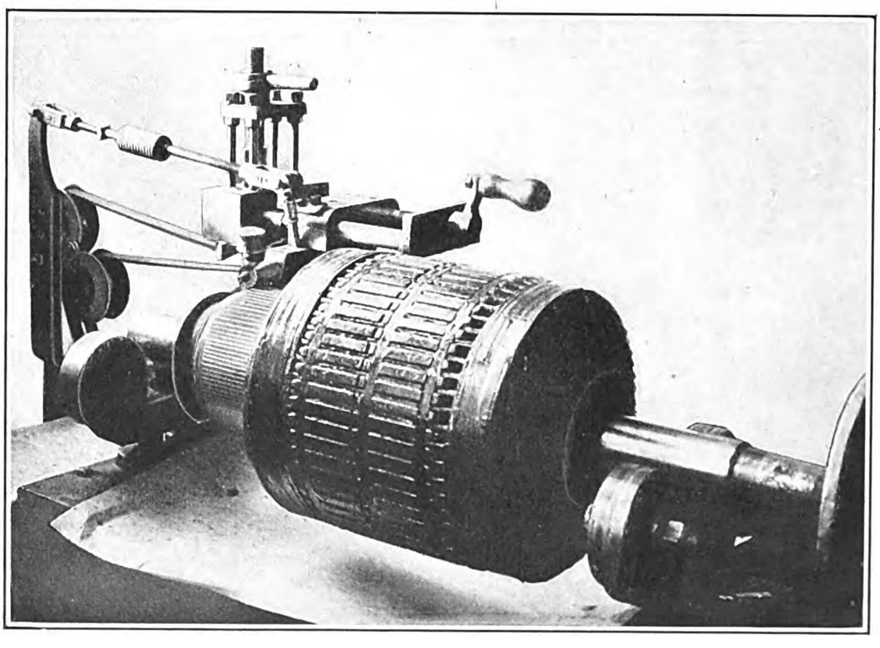
Four rods which are bolted into the body support a crosshead, and a screw working through this bears on the top of the vertical spindle. A handle attached to the top of the screw thus raises and lowers the block, so as to fit commutators of various diameters.

The slotter is driven by a type AA-1 compressor motor. An ingenious belt-tightening device is used. A vertical arm on which two pulleys are mounted is pivoted near the floor so that it can be moved back and forth in line with the pulley installed on the driving spindle of the slotter.

The belt coming from the top of the pulley on the motor passes over the lower pulley of the belt tightener, then around the driving pulley on the saw spindle, over the second belt tightening pulley and back to the motor. An adjusting rod extends from a clevis at the top of the belt tightening support to another clevis on the carriage of the slotter. The belt tightening pulleys thus move back and forth as the carriage is shifted so that the distance between the centers of the pulleys is kept constant.

The banding machine has a framework built of angles. One end of it fastens to the wall while the opposite end has legs for floor support. The machine is belt-driven through a worm gear, and a friction clutch transmits the rotation to the armature. A universal joint is used between the drive shaft and the friction clutch, so that exact lining up of the armature is not necessary for proper operation.

The armature is carried on pairs of rollers held in position by two pedestals. Adjustment to any de-

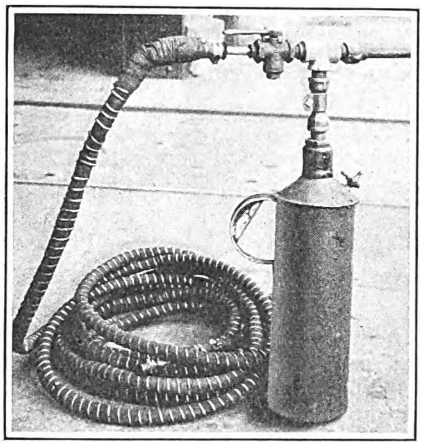


A Self-Adjusting Commutator Slotter Has Been Attached to the Banding Lathe in the Utica Park Shops of the New York State Railways

sired position is made by means of a lever. Supporting the armature on rollers protects the shaft from damage during the banding operation.

Outfit for Spray Painting Car Cables

CAR cables, motor leads, resistance leads, and splash guards are painted with insulating varnish while in place underneath car bodies of the New York State Railways, Syracuse Lines. It is impossible to do a satisfactory job with a brush due to the inaccessibility of many of the parts, so the varnish is sprayed on with the home-made equipment shown in the accompanying illustration. A 1-gal. tank with handle and provisions for pipe connections at the top is used. The upright pipe connection has a $\frac{3}{4}$-in. tee, one end of which is used for the spray nozzle and the other for the air connection. A shut-off valve is placed in the air supply line between the hose and the tee.



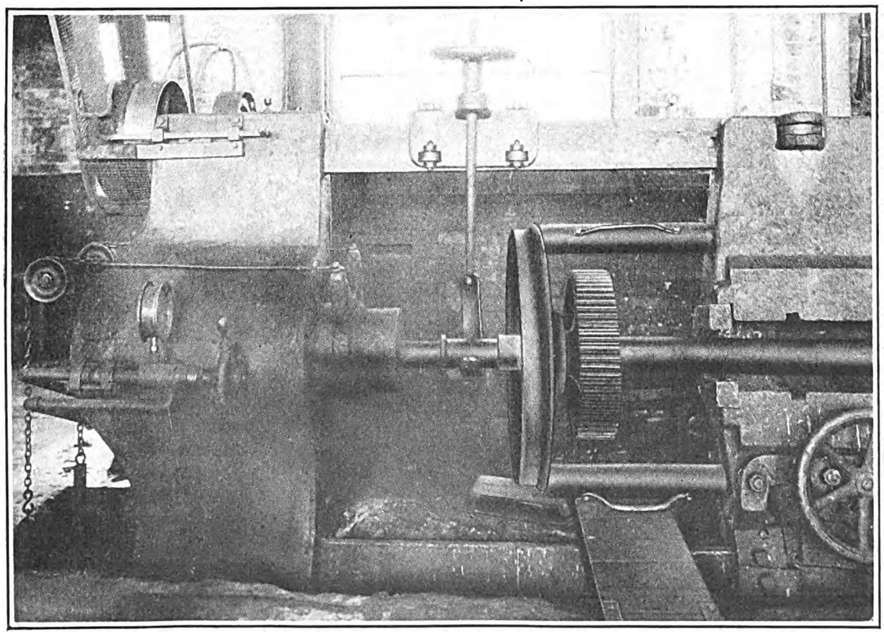
Spray Equipment Used to Paint Car Cables at Syracuse

With this connection, air at 75 lb. per square inch pressure from the shop supply is led to the top of the varnish in the receptacle. A $\frac{1}{8}$-in. pipe runs from the bottom of the can through the upright pipe connections and bends to the right with its end just back of the reduced part of the nozzle, forming an atomizer.

The end of the spray nozzle is of $\frac{3}{8}$-in. pipe, a reducer being used to fit it to the tee. With this apparatus leads and equipment under 40-ft. cars are painted by one man in approximately 10 minutes.

Special Push Pins for Wheel Removal

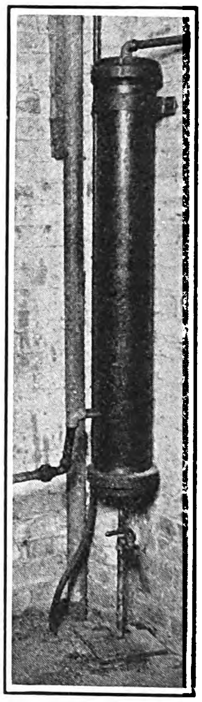
WHERE car wheels are large enough it is desirable to remove them with push pins placed over the outside of the gears. A convenient type of push pin with handles is used in the Utica Park shops of the New York State Railways. These are of 3-in. diameter steel and have two wrought-iron handles bolted to them for convenience in handling. To prevent the pins slipping against the head of the wheel press, their ends are turned down slightly, so as to have projections with a diameter of approximately $1\frac{1}{2}$ in. The head of the wheel press is also counterbored to receive these projections. The accompanying illustration shows a 33-in. wheel in position for removal, with the push pins resting against its rim of the wheel outside the gear.



Push Pins with Handles Are Convenient for Wheel Removal

Taking Moisture Out of Air

COMPRESSED air is used extensively in connection with the maintenance work at the Wolf Street shop of the New York State Railways, Syracuse. For blowing out motors, controllers and other electric railway equipment, it is essential that the air be dry, as otherwise there is danger of short circuits and grounds. In sandblasting operations, moisture in the air clogs up the equipment, which causes trouble and delay. To take the moisture out of the air the supply line has been equipped with moisture traps at various points in the shop. The moisture trap illustrated is installed in the paint shop, where air is used extensively for sandblasting cars previous to painting and varnishing. This moisture trap is made of a 6-in. pipe 4 ft. long. Standard pipe caps are fitted to each end. The air supply from the compressor is led into the moisture trap about 8 in. from the bottom, and the inside of the trap from this point to the top is filled with excelsior. The supply line used for attaching connections for sandblasting comes out of the top of the moisture trap, and a drain pipe is fitted to the bottom.



Air Moisture Trap

This moisture trap is used to keep compressed air dry in the Wolf Street paint shop of the New York State Railways.

Smaller size moisture traps are installed underneath benches and at points where connections are made for blowing out various parts of equipment. These are made of 2-in. pipe with standard caps and are about 2 ft. long. The air supply pipe in these smaller traps is led in about 3 in. from the bottom, and the connection for hose attachment is at the top. A drain valve is provided at the bottom. This arrangement of moisture traps has proved very effective in overcoming difficulties experienced from moisture in the shop air system.

The News of the Industry

State Supreme Court Hears Cleveland Controversy

Arguments were presented before the Ohio State Supreme Court in Columbus, Ohio, on April 28, in the wage arbitration controversy between the Cleveland Railway and the street car men's union. Attorneys for the union argued in favor of a motion to have the State Supreme Court hear the case on its merits. In the court of appeals the men lost when that court held that the "closed shop" contract between the union and the company was null and void on the ground of public policy and also held that the increase of 12 cents an hour awarded by the board of arbitration of a year ago was illegal on the ground that the fifth and key arbitrator in the case was prejudiced against the company.

The Supreme Court is expected to hand down its decision on the motion shortly. If this decision is unfavorable to the union, it means that henceforth there will be no contract between the Cleveland Railway and the union, thus ending the closed shop agreement. It will also mean that the men will not receive any increase in pay dating back to May 1, 1924. If the court rules in favor of the men, the State Supreme Court will rehear the entire case again on its merits.

Great Northern to Electrify Line

Electrification of 30 miles of main line of the Great Northern Railway, extending over the summit of the Cascade Mountains in Washington, will proceed immediately, according to Ralph Budd, president. Mr. Budd estimated the cost of equipment for the new line at $1,000,000 and said orders would be placed for four electric locomotives. Power will be obtained from the company's water power plant on the Wenatchee River.

The Great Northern's electrification will extend from Skykomish, on the west side of the Cascades, to Verne, on the east side, just beyond the portal of a tunnel through which the road pierces the summit.

The Great Northern already uses electric engines to haul its trains through the tunnel at the summit, the bore being 3 miles long. Mr. Budd said that discussion of a Great Northern railway tunnel 32 miles long to pierce the Cascades and give a near level grade through Washington had not reached a definite stage.

Verdict Favors Dallas Railway

The State Supreme Court in the case of F. J. Geller, on appeal, has upheld the right of a city to regulate rates of public utilities without submission of any proposed change to the electorate. Geller attacked the right of the city of Dallas to grant a 6-cent fare to the Dallas Railway as authorized in an ordinance passed on June 24, 1922. He claimed that under the franchise to the company granted in 1917 the fare was set at 5 cents, and that this should be maintained for the life of the franchise. His contention was that no revision could be made without submission of the question to the electorate.

The trial court sustained the special exceptions and general demurrer of the railway and dismissed the case. On appeal to the Fifth Court of Civil Appeals, in an opinion by Chief Justice Sargeant, the right of the city to change rates by ordinance was upheld, but the point was made that the ordinance should be inoperative until affirmed by a vote of the people.

The opinion of the Supreme Court quotes at length from the city charter of Dallas to show that the power to make rates of any public utility operating in the city may be changed and regulated by the commission without submission.

$200,000,000 Transit System on Coast

Engineers See Ultimate Need of This Expenditure for Los Angeles with $133,385,000 Program Now—Plan Embodies Seven Principal Features

AN IMMEDIATE expenditure of $133,385,000 for the city and county's proposed rapid transit system was suggested by Major R. F. Kelker, Jr., Chicago, in a report made on April 20 to the county of Los Angeles and city of Los Angeles. The report is now under consideration by the city and county governments. It recommends the following features:

1. Construction of subways, elevated lines and open cuts to be financed either by the issuance of 6 per cent public improvement fund bonds or obligations of assessment districts.
2. The immediate establishment of a rapid transit committee consisting of representatives of city and county governments, railroad commission authorities and representatives of the Los Angeles Railway and the Pacific Electric Railway, as well as representatives of various civic bodies, banking institutions, etc.
3. Immediate unification of the Los Angeles city local transportation system to be operated as one unit, extended to meet the needs of a city of 3,000,000 population.
4. Adoption of a policy, fixing a definite program of construction for the rapid transit system.
5. A method of accounting for the investments made by the public and by private capital as a basis for possible purchase of the system by the city of Los Angeles.
6. Establishment of a flat fare zone and a basis of determining rates, transfer privileges and disposition of receipts.
7. A plan for managing and operating the proposed unified system, as well as plans for providing for the construction of additional transit facilities.

It was urged in the report that the best method of financing the proposed rapid transit system would be by special property assessments. This principle was applied to permit property owners to select the particular type of structure to be constructed on each route, such as preference for subways, elevated lines or open cuts.

The greater traffic plan provides for the elimination of downtown traffic congestion, elimination of grade crossings, furnishing increased riding facilities for the public both in the metropolitan area and outlying zones of the city.

The idea would be to keep fares down so that riders will patronize the fast lines, using the outlying surface lines and buses to feed the rapid transit lines.

The report features two extensive subway trunk lines through the downtown business district, with entrances every four blocks. At Seventh and Broadway, the hub of the city's dense downtown traffic district, would be established the chief point of transfer of the two main trunk systems. Surface lines and bus routes would be increased and used for feeders for the tubes.

The report does not claim that the $200,000,000 expenditure is essential immediately, but that sum would be needed fully to carry out the plan in coming years. Immediate expenditures would entail an initial outlay of $133,385,000 for the following track mileage: Subways and tunnels, 26.1; elevated and open cut lines, 85.3, and street railways, 41.6.

A statement of track mileage of the entire comprehensive transportation system shows 588.6 miles now existing and under construction, 153 miles to be added immediately, 233.1 for future construction, a total construction of 386.1 miles, with a unified system of 274.7 miles, within a radius of 8 miles from the hub of the downtown district, namely, Seventh and Broadway, Los Angeles.

The estimated costs of work intended for immediate construction are as follows:

Rapid transit lines, northeastern section of city.........	$33,043,000
Rapid transit lines, Hollywood district and western section of the city	31,359,000
Rapid transit line, San Fernando Valley district........	4,678,000
Rapid transit lines, eastern section of city	28,951,000
Surface lines	4,006,000
Equipment: Cars, buses, substations, shops, yards, etc.......	18,200,000
Pacific Electric Railway Lines' extensions	13,148,000
Total	$133,385,000

In dealing with the Pacific Electric Railway expansion now, the report says:

> Freight traffic on the lines of this company, as they exist on the east and south sides, prevents the co-ordination of these lines with the proposed rapid transit system. In order that these lines also may be utilized for urban rapid transit, it is recommended that the Pacific Electric make certain improvements. The major portion of which it now has in contemplation.
>
> These improvements will provide facilities for urban rapid transit service in the northeast and southwest sections of the city, as well as for interurban service and freight service.

New Municipal Plan Proposed for Rockford

Seymour Stedman, president of the City-State Investment Company, Chicago, and Frederick S. Mordaunt, general manager of the public service utility department of that corporation, have placed a new municipal ownership project before the Rockford, Ill., City Council, more sweeping in its scope and utopian in its conception than anything Rockford has ever heard. The fight over renewal of the Rockford City Traction Company's franchise has been waging some time. The new proposition, filed in a sealed envelope with the city clerk, proposed that the City-State Investment Company join with the municipality in organizing, building and operating the city transportation system; that the city grant an all-embracing franchise, as liberal as Illinois laws will permit; that a financial program be instituted to give the city full control of the corporation without any investment, permitting the Council to appoint directors, executives and managers. The investment concern will receive 10 per cent of the construction cost and 10 per cent of the bond sale return.

The Rockford newspapers naïvely pointed out that under this financial arrangement, if the system represents a cost of $2,000,000, the Investment company will receive $400,000 for its promotion of the project and its activity.

Kansas City Bus Plan Progresses

Plans are going ahead rapidly for the early installation of Kansas City's new bus system, which is to be operated for a period of three years by the Kansas City Railways. The railways receivers have the final signed draft of Judge Kimbrough Stone's authorization of the acceptance of the conditions of the city franchise. They are said to have been notified previously that they might proceed with the plans for the expenditure necessary in purchasing buses, machinery and equipment, up to a certain maximum which has been set by Judge Stone, referee, at $750,000.

The service will utilize a total of 63 buses. The company has owned two of the buses for some time which have been operating in Kansas City, Kans., and it will be necessary to buy only 61 new buses now in order to care for the service properly. Nine routes are to be operated under the provisions of the ordinance, the fare to be 10 cents on eight of the lines and 25 cents on the remaining route, the latter being the only express service which will be maintained. Transfers will be given for interchange between buses and street cars for an additional charge of 3 cents.

Rainier Paving Dispute Aired Again

After a five-day hearing devoted to the taking of testimony, before Judge Edward E. Cushman in the United States District Court, in the suit of E. E. Markham and other property owners in the Rainier Valley district against the Seattle & Rainier Valley Railway, Seattle, Wash., both sides rested their cases and agreed to submit briefs. The suit originally was brought in the Superior Court of King County, but was remanded to the United States District Court for hearing. The property owners contend that the company, under the provisions of the franchise, is compelled to pave between the tracks on Rainier Avenue, and that failure on the part of the company to pave has kept the property owners from using their own property, increased fire risks, and deprived people residing in the valley of the use of public property.

In answer, the company contends that it has been relieved of its franchise mandates to pave by a special ordinance passed by the City Council; that the company is without money or credit to pay the $700,000 paving cost; that the more modern methods of handling traffic require separation of motor vehicle and street car traffic, and that by leaving the tracks unpaved, other traffic was forced to use the one-way paved strips on each side, much to the benefit of railway traffic.

Trolleys or Buses in Spartanburg to Be Decided May 12

The City Council of Spartanburg, S. C., passed an ordinance recently which calls for a special election on May 12, involving an amendment to the franchise now held by the South Carolina Gas & Electric Company whereby trolley service in the city of Spartanburg will be suspended as long as the company provides ample transportation service by means of buses. The amendment would add two lines to the one now being operated by the company. It would extend the 40-minute loop service from Morgan Square, Beaumont and Drayton and another loop from Morgan Square and South Converse and Union Street. The ordinance also provides that the company, at its own cost, co-operate with the city's paving plan. It is stipulated that if at any time the bus service fails to take care of the transportation situation the amendment becomes null and void and the company must re-lay the track and institute a trolley service.

The ordinance does not contemplate the suspension of operation of street cars to Glendale and Clifton. It is not the intention of the City Council to place before the people of Spartanburg the question whether street cars shall be operated outside the city limits. Luther K. Brice, Commissioner, stated that the street cars now operating to out-of-town points would not be affected by the outcome of the election. The action of the City Council is the direct outgrowth of action recently taken by the local Chamber of Commerce, which held that in view of the proposed $1,000,000 bond issue for municipal improvements, the people should decide whether they want trolleys or buses.

Traffic Survey in Washington

McClellan & Junkersfeld, Inc., New York, are to make a survey of transportation conditions in Washington, D. C., under the supervision of the Public Utilities Commission. The expense is to be borne by the North American Company, New York, which is represented as having a "substantial investment in transportation systems in the District."

According to Major W. E. R. Covell, who represented the commission in arranging for the survey, the forthcoming inquiry into transportation conditions as they now exist is probably the most constructive step ever taken toward a merger of the Washington Railway & Electric Company and the Capital Traction Company. He said, however, that the North American Company is neither for nor against a merger at this time. The company, Major Covell said, is frankly interested and desires to have the facts impartially determined so that it can base its future actions thereon.

The actual work of the survey will be in charge of F. W. Doolittle, vice-president of the engineering firm. He formerly had been connected with the Wisconsin Railway Commission, the Illinois Utility Commission, and was at one time director of the research bureau of the American Electric Railway Association.

The letter of Edwin Gruhl, vice-president and general manager of the North American Company, to the Public Utilities Commission, follows:

> Gentlemen: This will review our conferences concerning a transportation survey of the District of Columbia and record our understanding with respect to the following matters:
>
> 1. The Public Utilities Commission has found that a thorough study of the transportation situation in the District of Columbia is essential in order to procure ultimately for the District the best and most economical transportation service by coordination of existing facilities and the adoption of additional transportation agencies.
>
> 2. The North American Company at present has a substantial investment in transportation systems in the District, and accordingly is interested in a solution of the existing problem. As a result of a preliminary investigation, the North American Company has reached the conclusion that a thorough study of the present transportation situation is essential.
>
> 3. Because of this mutual interest the North American Company agrees to have made through McClellan & Junkersfeld, Inc., engineers, at a cost not to exceed $50,000, a fact-finding survey under the regulation and supervision of the commission. The results of this survey shall be reported to the commission and shall be available to the street railway companies operating in the District, to the North American Company, and otherwise, as the commission may direct.
>
> 4. Attached hereto, marked "Annex A," is an outline of data to be assembled, which is understood to represent the general scope of the survey proposed to be made.
>
> 5. This survey will be undertaken at the earliest practicable date and will be carried out as rapidly as may be consistent with the securing of the necessary basic data, including data presently available in the files of the commission.
>
> 6. In addition to providing the services of McClellan & Junkersfeld, Inc., for this survey the North American Company will defray any extra expenses incurred by the commission in supervising this survey.

The cost of carrying out the work incident to conducting the survey is estimated at $50,000.

Recent Bus Developments

Yonkers Railroad Competitor for Bus Rights—Delaware Company Takes Over Buses—Many Other Items of Interest

THE right to operate twelve bus routes totaling 86 miles in Yonkers, N. Y., was granted to the Westchester County Bus System, Inc., on April 22. In its plea for the right to run the company was successful over several competitors, among them the Third Avenue Railway System, New York City. The bus matter is said to have been brought to a head by the Yonkers Street Railroad, affiliated with the Third Avenue Railway, announcing that on May 12 it proposed to abandon five non-paying lines. Consent to do this was obtained from the Public Service Commission. The matter has been before the Council for ten months. Finis has not yet been written to it, first, because the Yonkers Street Railroad has announced its intention to carry the matter into the courts if necessary to prevent unfair competition with its lines, and, second, because Mayor Weisendanger has not yet passed upon the ordinance, against which sufficient Aldermen are opposed to defeat the matter if it should come up again for vote for passage over a veto. The expenditure for the proposed bus system is estimated at $615,700. Back of the new system as its operating head is A. E. Hutt, vice-president and general manager. Mr. Hutt has in the past been connected with the Detroit Motor Bus Company, the Philadelphia Rapid Transit Company and the Fifth Avenue Coach Company, New York.

T. W. Wilson, vice-president and general manager of the Wilmington & Philadelphia Traction Company, recently confirmed the rumor that a company which will be associated with the local traction system had arranged to purchase the Stiltz Brothers, Newark-Wilmington bus line. He stated that the new company which will take over this line expects to improve the present equipment and gradually make replacements with modern buses. Buses will operate on as frequent a schedule as business warrants and the rate of fare from Wilmington to Newark will remain the same as at present charged by Stiltz Brothers. Mr. Wilson said that his company has for some time been operating its trolley lines in Chester in association with the Southern Pennsylvania Bus Company, owned by the same interests as control the traction company. This bus line by special arrangement has established a system of transfer exchanges between the bus lines and the street cars which has proved satisfactory. It is the intention of the local traction company and the new bus company to work out a similar scheme of exchange tickets in Wilmington.

The Union Street Railway will establish a bus line between New Bedford, Mass., and Providence, R. I., with arrangements to supply service between New Bedford and Fall River. Elton S. Wilde, vice-president and general manager of the company, said that his company would file petitions immediately for bus licenses not only in New Bedford but in the surrounding towns and cities as well. Terminals will be established in New Bedford, Fall River and Providence.

The Iowa Southern Utilities Company, Centerville, Iowa, will substitute buses for its railway cars over the Centerville system. It has received a full complement of motor cars for the service, operating from South Centerville to railroad stations and the uptown business district. The company has substituted five buses on its West End and Bluff Road routes in Burlington for trolley cars.

Fares on the bus lines of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, were to be increased May 1, C. M. Cheney, president and general manager, announced recently, as the result of the action of the Iowa Legislature doubling the carrier tax on buses. The Waterloo-Cedar Falls fare, which was 15 cents, or ten tickets for $1.20, will be raised to 20 cents, or ten tickets for $1.50, and 5 cents has been added to the Waterloo-Cedar Heights tariff. The carrier tax on the route under the old statute ranged from $250 to $300 a month and will be twice that now. Two new buses have been added to the line, making a fleet of nine.

Bus fares on the former J-H lines to Franklin, Columbus and Seymour, Ind., from Indianapolis have been increased by the Interstate Public Service Company, which recently obtained control of the J-H system. Officials of the railway said rates had been restored to the original figures that prevailed when the line was established by A. G. Harmon in competition with the Interstate Public Service. The lowest fares were the result of a price-cutting war between the traction and bus companies. The rate to Franklin remains the same, but from Franklin to Columbus a 10-cent increase is made and from Columbus to Seymour a 20-cent increase.

The Olean, Bradford & Salamanca Railway has been granted a franchise by the Common Council of Salamanca, N. Y., to operate buses over eight streets in the city. By this decision the Council reverses its previous order when it refused the franchise. A number of changes were made in the proposed terms, principally that the duration will be ten years instead of fifteen and that the company will apply to the Public Service Commission in fifteen days for permission to operate buses, and if so permitted to run them over the eight streets within 60 days thereafter. The company also proposes to run bus lines between Salamanca and Little Valley and into the Alleghany State Park in connection with service in Salamanca. It has received permission to abandon its railway between Salamanca and Little Valley.

Mayor Curley of Boston, Mass., has taken the stand that the Boston Elevated Railway, as well as other established lines of transportation, should be protected against destructive competition from new lines of buses. He reiterated this position a few days ago when he approved eight petitions from the Boston Elevated for authority to operate buses in Boston and rejected several petitions which would have created competition with the railroads.

It is said that a petition is being circulated in High Point, N. C., calling for bus line additions to the street car service or bus lines as substitutes for the street cars. Henry Jennings, local manager for the North Carolina Public Service Company at High Point, said that the concern was ready to give the people what they wanted. The company is operating bus lines at Greensboro and Mr. Jennings said that their operation had been satisfactory.

The Ottawa Electric Railway, Ottawa, Ont., has received a license to operate buses to the Notre Dame Cemetery on the Montreal Road. The buses will run between the Notre Dame Cemetery and the corner of Rideau and Charlotte Streets, passing through the town of Eastview. A special Sunday service will be provided during the summer months. The fare for Sundays and weekdays will be 5 cents cash or ten tickets for 25 cents.

At a recent meeting of citizens of South Jacksonville, Ill., and officers of the Jacksonville division of the Illinois Power & Light Company the company proposed the substitution of bus service for trolleys in South Jacksonville. The plan is to remove all tracks south of Michigan Avenue to Nichols Park.

Uniform rules for the operation of buses in Massachusetts are being adopted by the Department of Public Utilities. Their origin lies with the Board of Selectmen, or Aldermen, in the various towns and cities, but they are made subject to approval by the State Department. The latest rules approved are for the town of Greenfield, which were adopted by the Selectmen and then changed by the State Department of Public Utilities, on the petition of residents of Greenfield, to conform to the basic principles laid down by the department some time ago for the city of Taunton and modified to meet later developments.

The Eastern Massachusetts Street Railway has obtained a license from the City Council in Cambridge, Mass., to operate buses in that city, on the condition that it will not pick up local passengers in the territory served by the Boston Elevated Railway. It is to take on passengers for points outside of Cambridge, on their way to Lowell. This is a part of the controversy which the Eastern Masschusetts has with the Boston & Maine Railroad over service between Boston and Lowell. The issue is not yet settled either in Lowell or in Woburn, where public hearings have been held. The Lowell City Council has decided to confer with Governor Fuller before deciding the issue.

New York State Interurban Rates Advanced

The Public Service Commission has granted permission to the New York State Railways to increase the commutation rates on its Rochester & Eastern and Rochester & Sodus divisions. The order provides that the company may revise its prices for 54-trip commutation books and for 46-trip school ticket books on a graduated basis, starting at 2 cents a mile.

The new schedules will remain in effect one year. The evidence showed a net loss of $72,174 for the twelve months ended Oct. 31, 1924, for the Rochester & Eastern and a loss of $93,364 for a similar period on the Sodus route. These facts influenced the commission to grant the increase. Under the proposed tariff the estimated increase in passenger revenue for one year will be $18,610 on the Rochester & Eastern and $10,410 on the Rochester & Sodus lines. School and college students and Rochester commuters will be most greatly affected.

News Notes

Revaluation Bill Tabled.—The Pennsylvania House of Representatives recently tabled the Schantz bill, fostered by Governor Pinchot, which provided an appropriation of $100,000 to the Public Service Commission to defray the expenses of a revaluation of the Philadelphia Rapid Transit Company. The Governor in appealing to the House said that the matter of a "reasonable rate of fare for Philadelphia" depended on the fate of the bill.

New Fare Rates Announced. — The Pittsburgh Railways, Pittsburgh, Pa., started on May 1 a number of additional privileges with regard to fares which have been approved by the Traction Conference Board. These include 10-cent round trip fares without transfers, and 5-cent fares with and without transfers. In honor of National Electric Railway Day, Tuesday, May 5, the company will make available the 25-cent and the 40-cent passes hitherto issued only on Sunday.

Peace in Albany.—After a deadlock over trolley fares between the city of Albany and the United Traction Company, differences have just been settled. The company agrees to withdraw its application to the Public Service Commission for a 10-cent fare. The city will withdraw its petition for a 5-cent fare. The city will give the Capitol District Transportation Company, a subsidiary of the United Traction, a franchise for operation of bus lines in several sections, and the traction company will grant to the city 33 ft. of roadway it owns. The truce is to continue until Jan. 1, 1926. The traction company announces that 42 new buses will be ordered at once.

Counsel Explains Valuation Procedure. — A. A. Stewart, corporation counsel, has filed an answer to the appeal of the St. Paul City Railway and the Minnesota Railroad and Warehouse Commission from the order of Judge R. D. O'Brien of the District Court that the company and the commission filed certified copies with the court of the proceedings in the valuation of the railway properties. He contends that the order is not appealable and that should the Supreme Court uphold the company it would establish a dangerous precedent and recognize its right to determine the jurisdiction of the court in the matter. In other words, that it would remove the control from the commission into the courts. The brief holds that the proper procedure would be for the commission to file a report and then ask the court to determine whether it had jurisdiction. If the commission's report is held subject to review by the court it would go on trial and the court would determine the true value of the railway properties, the corporation counsel submitted in his statement.

Fares Increased. — Fares in Fort Madison, Iowa, were raised to 7 cents, with four tickets for 25 cents, on April 26 by the Fort Madison Street Railway. The Fort Madison system had been operating at a 5-cent fare. President Schulze pointed out that 68 per cent of the operating cost went into wages and the company refused to increase its operating income by reduction of wages. The property is appraised at $225,000 and has failed to make an adequate return on that basis.

Present Fare Continued Pending Baltimore Valuation—The Public Service Commission of Maryland on April 15 extended the present 7½-cent fare of the United Railways & Electric Company until the valuation proceedings are concluded. The original order of the commission fixing the present fare became effective on May 31, 1924, and was to continue till April 30, 1925, unless extended by order of the commission or automatically extended because the valuation proceedings were in progress. As the valuation case will not begin until May 4 next, the commission ordered the extension.

Municipal Line to Use One-Man Cars. — The Kitchener Light Commission, Kitchener, Ont., in March made a profit of only $5.44 on the local street railway. As a result, Manager V. S. McIntyre, on the recommendation of the commissioners, is looking into the question of changing the Peter Witt cars on the Kitchener and Waterloo line into one-man affairs. The idea is to have them so constructed, if possible, that they may be operated as now by two men in the rush period.

Suggest Traffic Relief. — The Public Utilities Bureau, Louisville, Ky., has recommended to the city that all automobile parking on Fourth Street, between Main and Broadway, a distance of about eight blocks, be abolished to clear traffic congestion. At the present time there are regulations in effect which prevent parking during the peak traffic periods. The Board of Safety has been told that either parking should be eliminated, or Fourth Street made a one-way thoroughfare. Charles Roser, auditor of the Utilities Bureau, suggests that all parking be eliminated, making it possible for two streams of traffic to move each way on Fourth Street, and for autos to pass moving street cars.

Safety Course to Conclude.—The Safety Drivers' Club of the Western Pennsylvania Safety Council has been conducting a safety course for drivers in the auditorium of the Chamber of Commerce of Pittsburgh. The series of meetings, which ended on April 29, included talks by prominent speakers on the subject of traffic and safety as well as round-table discussion, singing and motion pictures bringing the lessons of safety home more forcibly. W. H. Boyce, commercial manager of the Pittsburgh Railways, is vice-president of the Safety Drivers' Club.

City Aids Railway.—The city of Findlay, Ohio, recently filed with the State Public Utilities Commission a resolution of the City Council, protesting against the commission's granting to any bus company a certificate to operate between the cities of Findlay and Toledo. The protest states that the Toledo, Bowling Green & Southern Traction Company is furnishing adequate service, and that if it is required to meet bus competition the railway line will be forced to suspend operations.

Jitney Business Remains Unchanged. —Since the passage of the new traffic ordinance in Terre Haute, Ind., restricting their operation, several operators of jitneys have quit the business, but just as quickly as their rights were surrendered others took them up. In this manner the number of jitneys in the city is practically the same as it was when the ordinance was signed. The only additional licenses which cover vehicles carrying passengers for hire are those issued to the Terre Haute, Indianapolis & Eastern Traction Company. For buses such as those operated by the traction company a license fee of $50 a year is paid, while the jitneys are charged at the rate of $25 a year. Figures at the office of the City Comptroller show 110 jitneys, taxis and buses in operation in Terre Haute at the present time. This is said to be practically the same number operating a year ago with the exception that buses of the traction company are now among those run.

Bus Ordinance Upheld.—In an appeal from the decision of Judge H. J. Grannis of the District Court, the Minnesota Supreme Court has upheld the ordinance passed by the voters in Duluth, Minn., on June 23, 1924, in the case of Carl H. Schultz, representing the Duluth Bus Association, with the Duluth Street Railway as intervenor. An injunction against enforcement of the ordinance was denied July 15, 1924. The ordinance prohibited intracity buses from operating on streets with double trolley tracks. The suit claimed the ordinance was discriminatory and in favor of the railway. The ordinance did not affect intercity buses. The court held that public welfare and safety demanded buses of the sort to be so limited as not to become a nuisance or a menace, and that the ordinance was enacted for this purpose and was not beyond the police powers of the city. Further, that where there were double trolley tracks there was no need for intracity buses, to say nothing of the danger and inconvenience of several competing buses.

Financial and Corporate

Denver Reorganization Ratified

Annual Interest Charge to Be Cut from $953,015 to $580,848—$4,000,000 Spent for Improvements

The protective committees for security holders of the Denver Tramway and of the holding company, the Denver & Northwestern Railway, Denver, Col., have adopted a plan of reorganization. The system has been operated by Ernest Stenger as receiver since Dec. 24, 1920. A joint reorganization committee has been named consisting of Claude K. Boettcher and Samuel M. Perry, Denver, and George C. Clark, Jr., New York, to execute the plan and call for deposit of securities.

The reorganization plan provides for the termination of the receivership and the organization of a new company to take over the property. It provides for the reduction of the funded debt of $17,541,700 to $11,078,350, and for the adjustment of the preferred stock of $3,953,337. Annual interest charges will be reduced from $953,015 to $580,848. The capitalization of the new company will consist of $4,635,000 of underlying bonds which will not be disturbed, $6,443,350 of new 5 per cent mortgage bonds, $10,318,145 of new 7 per cent preferred stock, and 6,250 shares of common stock without par value.

Holders of the Denver City Tramway first and refunding sinking fund mortgage 5 per cent bonds and of the Denver & Northwestern first and collateral mortgage 5 per cent bonds will be entitled to receive $500 in new 5 per cent mortgage bonds, and $758.33 for each $1,000 of principal of their bonds.

Holders of the Denver Tramway three-year 7 per cent collateral trust notes will be entitled to receive $500 in new 5 per cent mortgage bonds, and $732.69 in new preferred stock for each $1,000 of their notes. Stockholders of the Denver & Northwestern Railway, who pay assessment of $10 a share, will receive $10 par value of new preferred stock and one share of new common stock. Stockholders of the Denver Tramway upon paying an assessment of $6 a share will receive $6 par value of new preferred stock and three-fifths of a share of the new common stock.

It was stated on behalf of the committee that more than $4,000,000 has been spent by the receiver in putting the property in first class operating condition.

Income Balance in Tacoma $39,841

The Tacoma Railway & Power Company, Tacoma, Wash., during the year 1924 carried 25,499,946 revenue passengers and 2,719,718 free transfer passengers. More than 1,116,543 employees and others rode free. Total revenue from transportation was $1,427,647 and the average fare per passenger, including transfers, was 5.023 cents. Other operating revenues were $58,890, making total operating revenue $1,486,538, a gain of $81,311 over 1923. Total operating expense was $1,246,732, a decrease of $53,782 from the previous year, leaving net operating revenues of $221,805. Adding auxiliary operations, and deducting rent and taxes, the operating income was $116,892, a decrease of $34,096. After the further reduction of rent and taxes and other property charges, there was an income balance of $39,841 to be transferred to profit and loss account. This sum was $33,368 less than for the previous year.

The total investment of the Tacoma Railway & Power Company in road and equipment is given at $6,232,210. There is an unmatured funded debt of $5,544,000 and long-term open accounts of $95,000. The report shows that, deducting total liabilities from assets, $202,699 remained as a total corporate surplus credit.

Large Companies Made Best Showing in 1924

Returns from 370 Companies, Divided as to Annual Earnings and Character of Operations, Show that Larger Companies, Especially Those Operating Both City and Interurban Lines, Made Best Showing

FOR the electric railway industry the year 1924 began auspiciously. The first three months the traffic was at the high-water. Then the general business slump made itself felt and traffic was continuously below normal until the late fall, when, with the sudden recovery of general business, it rebounded too and closed the year on the crest of a wave.

Edmund J. Murphy, chief statistician of the American Electric Railway Association, writing in *Aera* for May, says that the outstanding fact brought out by the segregation of companies according to size is that the small organizations, those serving cities and towns under say 50,000 population, are having a hard time. In the larger cities and more densely settled communities the automobile has reduced the rate of increase in riding. As diagnostician of the symptoms manifested in this remarkable annual study, this year showing the operating results of 370 companies, Mr. Murphy says it behooves the railways to make careful studies of their traffic with the idea of trying to adjust the physical layout of their lines and their service more and more closely to the traffic demands of their communities.

As for the figures of operation for the year, a recapitulation of them shows that electric railway traffic in 1924 was approximately 1 per cent less than in 1923. A group of 370 companies reports a total of 13,483,075,342 passengers in 1924 compared with 13,642,989,110 passengers in 1923. These figures include the companies in New York City. If the New York companies are excluded the figures become 11,410,795,999 in 1924 and 11,674,013,336 in 1923, a decrease of 2.26 per cent. Traffic in New York increased from 2,756,463,910 to 2,854,574,555, or about 3.55 per cent.

The railway operating revenues of the group of 370 companies, including New York, were $786,530,422 in 1924 and $794,252,546 in 1923, a decrease of 0.98 per cent. Operating expenses also decreased 0.58 per cent and this tended in some degree to offset the loss of traffic. The operating ratio in 1924 was 73.90 per cent, compared with 73.61 per cent in 1923.

A summary of these figures is presented in the following table:

COMBINED OPERATIONS OF 370 COMPANIES

	1924	1923	Per Cent Increase or Decrease
Operating revenue	$786,530,422	$794,252,546	*0.98*
Operating expense	581,288,567	584,674,342	*0.58*
Net operating revenue	205,241,855	209,578,204	*2.07*
Operating ratio	73.90%	73.61%	0.39
Miles of track	32,083.3	32,032.5	0.15
Revenue passengers	10,890,887,334	10,906,853,081	*0.16*
Total passengers	13,483,075,342	13,642,989,110	*1.18*
Car-miles (rev.)	1,843,827,779	1,823,941,852	1.09

Figures in *italic* show decrease.

The companies included in this statement operate about 75 per cent of the total track and account for nearly 85 per cent of the gross revenues of the industry.

Mr. Murphy says that in considering the effect of business depression on electric railway traffic, therefore, some allowance should be made for this factor of competition. It is his idea that it is almost impossible to estimate its magnitude, but whatever it is, it would reduce just so much the effect of business depression indicated in the above mentioned table, since the loss in electric railway traffic shown there includes whatever losses are due to bus competition.

Reports from 261 companies that gave complete statements are summarized in the tables accompanying this article. These companies operate some 25,000 miles of track or almost 60 per cent of the total for the industry. About 40 per cent of this track is city track, 36 per cent interurban and 24 per cent combination city and interurban; that is, it is operated by companies doing both a city and an interurban business.

The operations of this group in 1924 follow very closely the trend of the

Statistics Compiled by American Electric Railway Association

TABLE I—COMBINED INCOME STATEMENT OF 261 RAILWAYS

	1924	1923	(D)	Increase or Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$536,059,372	$545,975,086	(D)	$9,915,714	(D) 1.82
Railway operating expense	405,426,764	409,751,971	(D)	4,325,207	(D) 1.06
Net operating revenue	$130,632,608	$136,223,115	(D)	5,590,507	(D) 4.10
Net revenue: Auxiliary operations	13,427,623	12,371,940		1,055,683	8.53
Taxes	36,432,539	37,255,887	(D)	823,348	(D) 2.20
Operating income	$107,627,692	$111,339,168	(D)	3,711,476	(D) 3.33
Non-operating income	9,373,148	9,371,738		1,410	.02
Gross income	a$117,059,720	b$120,780,003	(D)	3,720,283	(D) 3.08
Deductions from gross income	97,954,384	95,263,337		2,691,047	2.92
Net income	$19,105,336	$25,516,666	(D)	6,411,330	(D) 25.13
Operating ratio (per cent)	75.63	75.05		.58	.77
Ratio: Net income to operating revenue	3.56	4.67	(D)	1.11	(D) 23.77

a Includes $58,880 equalization income. b Includes $69,097 equalization income.

TABLE II—COMBINED INCOME STATEMENT (ON A CAR-MILE BASIS) OF 261 RAILWAYS

	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Railway operating revenue	45.39	46.36	(D) 2.09
Railway operating expense	34.33	34.79	(D) 1.32
Net operating revenue	11.06	11.57	(D) 4.41
Net revenue: Auxiliary operations	1.14	1.05	8.57
Taxes	3.09	3.16	(D) 2.21
Operating income	9.11	9.46	(D) 3.70
Non-operating income	.80	.79	1.26
Gross income	9.91	10.25	(D) 3.32
Deductions from gross income	8.29	8.09	2.47
Net income	1.62	2.16	(D) 25.00

TABLE III—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 261 RAILWAYS

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$59,633,070	$62,232,967	(D) $2,599,897	(D) 4.18
Equipment	50,806,101	50,053,439	752,662	1.50
Power	57,068,262	61,809,892	(D) 4,741,630	(D) 7.67
Conducting transportation	172,253,557	170,261,073	1,992,484	1.17
Traffic	1,777,213	1,614,910	162,303	10.05
General and miscellaneous	58,605,725	58,672,170	(D) 66,445	(D) 1.13
Transportation for investment—Cr.	—228,722	—192,360	36,362	18.90
Total operating expense	a$405,426,766	b$409,751,965	(D) 4,325,199	(D) 1.06

a Includes $5,511,560 undistributed expense. b Includes $5,299,873 undistributed expense.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM ACCOUNTS OF 261 RAILWAYS

	1924	1923	Per Cent Increase or (D) Decrease
Railway operating revenue	$536,059,372	$545,975,086	(D) 1.82
Per mile of single track	21,677	22,117	(D) 1.99
Gross income	$117,059,720	$120,780,003	(D) 3.09
Per mile of single track	4,733	4,886	(D) 3.14
Passenger revenue	$504,191,727	$512,961,939	(D) 1.71
Per revenue passenger	[1]7.0c	[1]7.1c	(D) 1.41
Per total passenger	[1]5.6c	[1]5.6c	....
Per mile of single track	[2]$20,388	[3]$20,695	(D) 1.49
Per passenger car-mile	[2]43.7c	[2]44.6c	(D) 2.02
Per car operated	[3]16,418	[3]16,888	(D) 2.79
Per passenger car-hour	[4]4.06	[4]4.14	(D) 1.94
Revenue passengers	[5]7,093,827,117	[5]7,185,734,125	(D) 1.28
Per mile of single track	[6]297,047	[6]301,134	(D) 1.36
Per passenger car-mile	[5]6.2	[5]6.3	(D) 1.58
Per car operated	[6]240,316	[6]245,459	(D) 2.10
Per passenger car-hour	[7]61	[7]61	....
Total passengers	[5]8,886,095,509	[5]9,044,022,386	(D) 1.75
Per mile of single track	[5]372,097	[5]379,009	(D) 1.83
Per passenger car-mile	[5]7.8	[5]8.0	(D) 2.50
Ratio: Transfer passengers to revenue passengers (per cent)	24.2%	24.8%	(D) 2.42
Revenue car miles	1,180,828,184	1,177,772,172	0.25
Per mile of single track	47,750	47,710	0.08
Per car operated	[8]37,797	[8]38,030	(D) 0.62
Per car-hour	[4]9.29	[4]9.27	0.21
Car-hours	[4]117,030,865	[4]116,961,279	0.21
Per car operated	[9]4,061	[9]4,064	(D) 0.08

[1] 256 companies. [2] 261 companies. [3] 217 companies. [4] 230 companies. [5] 255 companies. [6] 211 companies. [7] 224 companies. [8] 210 companies. [9] 200 companies.

TABLE V—OPERATING EXPENSES (PER CAR-MILE) OF 261 RAILWAYS

	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Way and structures	5.05	5.28	(D) 4.73
Equipment	4.30	4.25	1.17
Power	4.83	5.25	(D) 8.00
Conducting transportation	14.59	14.46	.89
Traffic	.15	.13	15.38
General and miscellaneous	4.96	4.98	(D) .40
Transportation for investment—Cr	.02	.02	....
Total operating expenses	a34.33	b34.79	(D) 1.32

a Includes 0.46 cent of undistributed expense. b Includes 0.45 cent of undistributed expense.

TABLE VI—OPERATING STATISTICS OF 261 RAILWAYS

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	1,149,789,200	1,148,164,918	1,624,282	.14
Total revenue car-miles	1,180,828,184	1,177,772,172	3,056,012	.26
Revenue passengers[1]	7,098,827,117	7,185,734,125	(D) 91,007,008	(D) 1.28
Transfer passengers[2]	1,719,962,687	1,782,071,055	(D) 62,108,368	(D) 3.49
Total passengers[4]	8,886,095,509	9,044,022,386	(D) 157,926,877	(D) 1.75
Passenger revenue	$504,191,727	$512,961,939	(D) 8,770,212	(D) 1.71
Revenue car-hours[3]	117,030,865	116,961,279	69,586	.06
Passenger car-hours[3]	115,508,947	115,490,586	18,361	.02
Miles of single track	24,728.9	24,685.6	43.3	.18
Cars operated[4] a	27,629	27,365	264	.96

a Average maximum number of cars in service daily. [1] Reported by 255 companies. [2] Reported by 178 companies. [3] Reported by 230 companies. [4] Reported by 214 companies.

TABLE VII—COMBINED INCOME STATEMENT OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$349,247,964	$350,874,322	(D) $1,626,358	(D) .46
Railway operating expense	257,388,946	256,964,877	424,069	.17
Net operating revenue	$91,859,018	$93,909,445	(D) 2,050,427	(D) 2.18
Net revenue: Auxiliary operations	3,367,854	3,331,965	35,889	1.07
Taxes	24,044,781	24,354,592	309,811	1.27
Operating income	$71,182,091	$72,886,818	(D) 1,704,727	(D) 2.33
Non-operating income	5,162,204	5,190,904	(D) 28,700	(D) .55
Gross income	a$76,403,175	b$78,146,819	(D) 1,743,644	(D) 2.23
Deductions from gross income	60,733,259	58,675,219	2,058,040	3.50
Net income	$15,669,916	$19,471,600	(D) 3,801,684	(D) 19.51
Operating ratio (per cent.)	73.70	73.23	.47	.64
Ratio: Net income to operating revenue	4.49	5.55	(D) 1.06	(D) 19.10

a Includes $58,880 equalization income. b Includes $69,097 equalization income.

TABLE VIII—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$35,065,896	$36,797,154	(D) $1,731,258	(D) 4.70
Equipment	32,790,468	31,352,968	1,437,500	4.58
Power	33,682,729	36,450,146	(D) 2,767,417	(D) 7.59
Conducting transportation	115,705,847	113,234,028	2,471,819	2.18
Traffic	628,979	493,609	135,370	27.42
General and miscellaneous	35,165,637	34,587,227	578,410	1.67
Transportation for investment—Cr.	—174,184	—138,929	35,255	25.37
Total operating expense	a$257,388,946	b$256,964,877	424,069	.16

a Includes $4,523,573 undistributed expense. b Includes $4,188,673 undistributed expense.

TABLE IX—OPERATING STATISTICS OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	745,396,139	745,011,162	384,977	.05
Total revenue car-miles	747,767,250	747,501,171	266,079	.03
Revenue passengers[1]	5,218,486,238	5,348,283,037	(D) 129,796,799	(D) 2.43
Transfer passengers[2]	1,485,851,328	1,499,527,955	(D) 13,676,632	(D) .91
Total passengers[3]	6,749,384,004	6,897,294,982	(D) 147,910,978	(D) 2.14
Passenger revenue	$340,688,213	$342,007,362	(D) $1,319,149	(D) .38
Revenue car-hours[3]	79,221,419	78,993,517	227,902	.29
Passenger car-hours[3]	78,999,684	78,743,232	256,452	.33
Miles of single track	9,837.4	9,818.5	18.9	.19
Cars operated[4]a	18,804	18,835	(D) 31	.16

a Average maximum number of cars in service daily. [1] Reported by 91 companies. [2] Reported by 78 companies. [3] Reported by 90 companies. [4] Reported by 84 companies.

TABLE X—INCOME STATEMENT OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$95,267,622	$101,063,931	(D) $5,796,309	(D) 5.7
Railway operating expense	78,316,953	80,495,296	(D) 2,178,343	(D) 2.71
Net operating revenue	$16,950,669	$20,568,635	(D) 3,617,966	(D) 17.58
Net revenue: Auxiliary operations	5,611,603	4,994,352	617,251	1.23
Taxes	5,883,625	6,152,290	(D) 268,665	(D) 4.37
Operating income	$16,678,647	$19,410,697	(D) 2,732,050	(D) 14.07
Non-operating income	1,732,105	1,599,620	132,485	8.28
Gross income	$18,410,752	$21,010,317	(D) 2,599,565	(D) 12.37
Deductions from gross income	18,447,211	18,195,278	251,933	1.38
Net income	*$36,459	$2,815,039	(D) 2,851,498	(D) 101.27
Operating ratio (per cent)	82.21	79.65	2.56	3.21
Ratio: Net income to operating revenue	*.38	2.78	(D) 3.16	(D) 113.66

*Deficit.

TABLE XI—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$14,298,619	$14,209,359	$89,260	.63
Equipment	9,485,938	9,744,305	(D) 258,367	(D) 2.65
Power	12,561,728	13,712,347	(D) 1,150,619	(D) 8.39
Conducting transportation	28,667,944	29,068,499	(D) 400,555	(D) 1.38
Traffic	663,122	671,425	(D) 8,303	(D) 1.24
General and miscellaneous	12,472,997	12,937,519	(D) 464,522	(D) 3.59
Transportation for investment—Cr.	—21,324	—15,066	6,258	41.53
Total operating expense	*a*$78,316,955	*b*$80,495,290	(D) 2,178,335	(D) 2.71

a Includes $187,931 undistributed expense. *b* Includes $166,902 undistributed expense.

TABLE XII—OPERATING STATISTICS OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	200,335,929	202,483,275	(D) 2,147,346	(D) 1.06
Total revenue car-miles	221,392,024	222,435,459	(D) 1,043,435	(D) .46
Revenue passengers.[1]	798,675,510	850,111,921	(D) 51,436,411	(D) 6.05
Transfer passengers[2]	138,529,672	140,303,996	(D) 1,774,324	(D) 1.26
Total passengers[1]	942,840,718	996,073,786	(D) 53,233,068	(D) 5.34
Passenger revenue	$78,694,254	$83,741,008	(D) $5,046,754	(D) 6.03
Revenue car-hours[3]	17,538,703	17,806,295	(D) 267,592	(D) 1.50
Passenger car-hours[3]	16,559,006	16,883,604	(D) 224,598	(D) 1.33
Miles of single track	8,984.3	8,929.9	54.4	.61
Cars operated[4]*a*	4,304	4,144	160	3.86

a Average maximum number of cars in service daily. [1] Reported by 109 companies. [2] Reported by 54 companies. [3] Reported by 90 companies. [4] Reported by 86 companies.

TABLE XIII—INCOME STATEMENT OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$91,543,786	$94,036,833	(D) $2,493,047	(D) 2.65
Railway operating expense	69,720,865	72,291,798	(D) 2,570,933	(D) 3.56
Net operating revenue	$21,822,921	$21,745,035	77,886	.35
Net revenue: Auxiliary operations	4,448,166	4,045,623	402,543	.99
Taxes	6,504,133	6,749,005	(D) 244,872	(D) 3.63
Operating income	$19,766,954	$19,041,653	725,301	3.81
Non-operating income	2,478,839	2,581,214	(D) 102,375	(D) 3.96
Gross income	$22,245,793	$21,622,867	622,926	2.88
Deductions from gross income	18,773,914	18,392,840	381,074	2.07
Net income	$3,471,879	$3,230,027	$241,852	7.49
Operating ratio (per cent)	76.16	76.88	(D) .72	(D) .94
Ratio: Net income to operating revenue	3.79	3.43	.36	10.49

TABLE XIV—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$10,268,555	$11,226,454	(D) $957,899	(D) 8.53
Equipment	8,529,695	8,956,166	(D) 426,471	(D) 4.76
Power	10,823,805	11,647,399	(D) 823,594	(D) 7.07
Conducting transportation	27,879 766	27,958 546	(D) 78 780	(D) .28
Traffic	485,112	449,876	35,236	7.83
General and miscellaneous	10,967,091	11,147,424	(D) 180,333	(D) 1.61
Transportation for investment—Cr.	—33,214	—38,365	(D) 5,151	(D) 13.42
Total operating expense	*a*$69,720,865	*b*$72,291,798	(D) $2,570,933	(D) 3.55

a Includes $800,055 undistributed expense. *b* Includes $944,289 undistributed expense.

TABLE XV—OPERATING STATISTICS OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	204,057,142	200,670,481	3,386,661	1.69
Total revenue car-miles	211,668,910	207,835,542	3,833,368	1.84
Revenue passengers[1]	1,076,665,369	987,339,167	89,326,202	9.0
Transfer passengers[2]	95,581,687	142,239,104	(D) 46,657,417	(D) 3.28
Total passengers[1]	1,193,870,787	1,150,653,618	43,217,169	3.76
Passenger revenue	$84,809,260	$87,213,569	(D) $2,404,309	(D) 2.75
Revenue car-hours[3]	20,270,743	20,161,467	109,276	.54
Passenger car-hours[3]	19,950,257	19,863,750	86,507	.44
Miles of single track	5,907.2	5,937.2	(D) 30.0	(D) .48
Cars operated [4]*a*	4,521	4,386	135	3.07

a Average maximum number of cars in service daily. [1] Reported by 55 companies. [2] Reported by 46 companies. [3] Reported by 50 companies. [4] Reported by 44 companies.

larger group. The total number of passengers carried was 8,886,095,509, as compared with 9,044,022,386 in 1923, a decrease of 1.75 per cent. Operating revenue dropped 1.82 per cent from $545,975,086 to $536,059,372, or a loss in revenue of $9,915,714. A drop in operating expenses of nearly 1 per cent, however, made the decrease in net revenue only $5,590,507. There was, therefore, a slight increase in the operating ratio from 75.05 per cent to 75.63 per cent.

An increase of more than $1,000,000 in the net revenue from auxiliary operations, together with a decrease of $823,348 in taxes, further reduced the loss, so that the gross income available to meet fixed charges was only $3,720,283 less than in 1923. Fixed charges, however, increased $2,691,047, or 2.92 per cent, and the final net income was $6,411,330 under 1923. The respective amounts were $19,105,336 in 1924 and $25,516,666 in 1923, or a decrease of 25 per cent.

These net incomes were 3.56 per cent of the operating revenue in 1924 and 4.67 per cent in 1923.

The outstanding features of this statement are undoubtedly the drop in the operating revenue and the indication that operating costs are becoming stabilized. The latter is even more significant than the former, for the loss in revenue was due to a temporary slump in business, which already is by way of being forgotten, while the stabilizing of costs promises to continue to be a source of strength to the industry in the future. What change there was in cost of operation was downward. By reason of it this group of companies was able to furnish more service in 1924 than in 1923 with an expenditure of $4,325,207 less. They operated over 3,000,000 more car-miles and still reduced operating expenses more than 1 per cent.

As already stated, this group of companies is made up of city lines, interurban lines and combination city and interurban lines. In the tables there are separate statements for each of these groups and each group is further subdivided according to the sizes of the companies.

The best showing of the year was made by the combination city and interurban companies. The number of revenue passengers carried increased about 9 per cent. Due to a lower average rate of fare, however, the operating revenue decreased 2.65 per cent. This was more than offset by a decrease of 3.56 per cent in operating expenses, leaving a net revenue 0.36 per cent greater than in 1923. Taxes also were reduced, and although fixed charges were higher they were not enough to cancel the other gains, so that there was an increase of more than 7 per cent in net income. The operating ratio of this group dropped from 76.88 to 76.16 per cent.

When the group is further subdivided according to the sizes of the companies it is found that the improvement is confined to the large companies—those earning more than $1,000,000 a year. The operating ratio of these companies dropped from 75.13 per cent to 73.94 per cent and the final net income increased some $314,000, or 9.27 per cent. On the other hand, the medium-sized companies fared badly. The operating ratio rose from 83.44 to 84.76 per cent. The small companies of this group, earning less than $250,000 a year, fared even worse than the others. The operating ratio of these companies was 87.56 per cent in 1923 and in 1924 it was 91.94 per cent.

The interurban companies had a very bad year. The combined income statement of the whole group, consist-

TABLE XVI—INCOME STATEMENT OF 93 CITY COMPANIES, 111 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

(On a car-mile basis)

	City Lines			Interurban Lines			City and Interurban Lines		
	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Railway operating revenue	46.70	46.93	(D) .49	43.03	45.44	(D) 5.30	43.25	45.25	(D) 4.42
Railway operating expense	34.42	34.37	.15	35.37	36.19	(D) 2.27	32.94	34.78	(D) 5.29
Net operating revenue	12.28	12.56	(D) 2.23	7.66	9.25	(D) 17.18	10.31	10.47	(D) 1.53
Net revenue: Auxiliary operations	.45	.45	....	2.53	2.25	12.44	2.10	1.94	8.24
Taxes	3.21	3.26	(D) 1.53	2.66	2.77	(D) 3.97	3.07	3.25	(D) 5.54
Operating income	9.52	9.75	(D) 2.36	7.53	8.73	(D) 1.37	9.34	9.16	1.97
Non-operating income	.69	.70	(D) 1.43	.78	.72	8.33	1.17	1.24	(D) 5.64
Gross income	10.21	10.45	(D) 2.30	8.31	9.45	(D) 12.06	10.51	10.40	1.05
Deductions from gross income	8.12	7.85	3.43	8.33	8.18	1.83	8.87	8.85	.22
Net income	2.09	2.60	(D) 19.62	*.02	1.27	(D) 101.57	1.64	1.55	5.80

* Deficit.

TABLE XVII—OPERATING EXPENSES OF 93 CITY COMPANIES, 111 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

(On a car-mile basis)

	City Lines			Interurban Lines			City and Interurban Lines		
	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease
Way and structures	4.68	4.92	(D) 4.88	6.46	6.39	1.09	4.85	5.40	(D) 10.18
Eqipment	4.38	4.19	4.53	4.28	4.38	(D) 2.28	4.03	4.31	(D) 6.49
Power	4.50	4.87	(D) 7.60	5.67	6.16	(D) 8.27	5.11	5.60	(D) 8.74
Conducting transportation	15.48	15.15	2.18	12.95	13.07	(D) .092	13.17	13.44	(D) 2.01
Traffic	.08	.07	14.28	.29	.30	(D) 3.33	.23	.22	4.54
General and miscellaneous	4.70	4.62	1.73	5.63	5.82	(D) 3.26	5.18	5.35	(D) 3.17
Transportation for investment—Cr.	.02	.02	....	.01	.01	....	.01	.01	....
*Total operating expense	34.44	34.39	.14	35.37	36.20	(D) 2.30	32.95	34.78	(D) 5.26
*Undistributed expense included in total	.60	.55	9.09	.08	.07	14.28	.37	.45	(D) 17.77

ing of 111 companies, shows a net income of $2,815,039 in 1923 turned into a deficit of $36,459 in 1924. Passenger traffic was off about 6 per cent and operating revenue declined 5.74 per cent, while the operating ratio rose from 79.65 per cent to 82.21 per cent. Taxes went down 4.37 per cent, but fixed charges increased 1.38 per cent. Again, as in the case of the combination group, it was the smaller companies that were most adversely affected.

Operations of the city lines were affected more in 1924 by the uncertain business conditions and less by private automobile and bus competition. Passenger traffic for the whole group decreased only a little more than 2 per cent. The average rate of fare, on the other hand, was increased from 6.3 cents to 6.5 cents, so that the decrease in revenue was only 0.46 per cent. Operating expenses, however, increased slightly, 0.17 per cent, so that there was a decrease in net operating revenue of 2.18 per cent. This increase in operating expenses was due to the fact that practically all of the increase in the maintenance of equipment and conducting transportation accounts described in connection with the review of the combined statement of the whole industry is chargeable to the operations of the city lines.

The operating ratio went up from 73.23 per cent to 73.70 per cent. Taxes increased 1.27 per cent and fixed charges 3.50 per cent, producing a decrease in the final net income of 19.51 per cent.

The very small city lines are in the poorest condition of any of the groups in the country; their combined operations are so comparatively small, however, that they weigh very little in the group.

Railway in Phoenix to Quit on Oct. 20

At a recent meeting of stockholders of the Phoenix Railway, Phoenix, Ariz., it was unanimously voted to cease operations of all of its city and suburban lines on Oct. 20. In fulfillment of this action the company has served official notice on the Arizona Corporation Commission, the City Commission and County Supervisors of its intention. This notice is signed by M. H. Sherman, president, and A. I. Smith, secretary of the company.

The railway dates back to 1887. It was electrically equipped in 1893 and later extended to nearly all sections of the city. Practically all the stock and the bonds are understood to be in the hands of Los Angeles residents. With development of auto transportation, the revenues of the company decreased materially, while paving charges and taxes increased.

A sale of the system is said to have been prevented by a suit for annulment of franchise filed against the company by Mayor L. B. Whitney about a year ago. It is understood that the system will be offered for sale for the value of its material. Efforts already have been started looking toward its acquisition by the city, for possible resale or lease. Several members of the City Commission express opposition to abandonment and to reliance on bus lines, two of which have asked for franchises.

Phoenix is a city of about 30,000. The railway has been operating 32 miles of line.

TABLE XVIII—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

	93 City Companies			111 Interurban Companies			57 Companies Operating Combined City and Interurban Lines		
	1924	1923	Per Cent Increase	1924	1923	Per Cent Increase	1924	1923	Per Cent Increase
Railway operating revenue	$349,247,964	$350,874,322	(D) 46	$95,267,622	$101,063,931	(D) 5.73	$91,543,786	$94,036,833	(D) 2.65
Per mile of single track	[1]$35,501	[1]$35,736	(D) .65	$10,603	$11,317	(D) 6.30	$15,497	$15,838	(D) 2.15
Gross income	$76,403,175	$78,146,819	(D) 2.24	$18,410,752	$21,010,317	(D) 12.38	$22,245,793	$21,622,867	2.88
Per mile of single track	$7,766	$7,959	(D) 2.43	$2,049	$2,352	(D) 12.89	$3,765	$3,641	3.40
Passenger revenue	$340,688,213	$342,007,362	(D) .38	$78,694,254	$83,741,008	(D) .60	$84,809,260	$87,213,569	(D) 2.75
Per revenue passenger	[1]6.5c	[1]6.3c	3.18	[2]9.6c	[2]9.6c	....	[3]7.9c	[3]8.8c	(D) 10.22
Per total passenger	[1]5.0c	[1]5.0c	(D) ...	[2]8.1c	[2]8.2c	(D) 1.21	[3]7.1c	[3]7.6c	(D) 7.58
Per mile of single track	34,631	$34,833	(D) .58	$8,759	$9,377	(D) 6.59	$14,357	$14,689	(D) 2.26
Per passenger car-mile	j45.7c	45.9c	(D) .43	39.2c	'41.3c	(D) 5.08	41.2c	43.1c	(D) 4.41
Per car operated	[4]$16,894	[4]$16,946	(D) .31	[6]$15,713	[6]$17,188	(D) 8,58	[7]$15,107	[7]$16,357	(D) 7.64
Per passenger car-hour	[5]$4.08	[5]$4.13	(D) 1.21	[5]$4.20	[5]$4.36	(D) 3.66	[8]$3.85	[8]$3.99	(D) 3.50
Revenue passengers	[1]5,218,486,238	[4]5,348,283,037	(D) 2.42	[2]798,675,510	[2]850,111,921	(D) 6.05	[9]1,076,665,369	[9]97,339,167	9.04
Per mile of single track	[1]530,910	[1]545,166	(D) 2.61	[2]90,643	[2]96,665	(D) 6.22	[9]205,448	[9]187,796	9.39
Per passenger car-mile	[1]7.0	[1]7.2	(D) 2.78	[2]4.1	[2]4.2	(D) 2.38	[9]5.6	[9]5.3	5.67
Per car operated	[10]258,142	[10]263,832	(D) 2.16	[12]172,630	[12]189,624	(D) 8.96	[13]229,126	[13]215,039	6.56
Per passenger car-hour	[11]62	[11]63	(D) 1.59	[11]55	[11]58	(D) 5.17	[14]57	[14]53	7.54
Total passengers	[1]6,749,384,004	[1]6,897,294,982	(D) 2.14	[2]942,840,718	[2]996,073,786	(D) 5.34	[9]1,193,870,787	[9]1,150,653,618	3.75
Per mile of single track	[1]686,658	[1]703,062	(D) 2.33	[2]107,004	[2]113,262	(D) 5.52	[9]227,813	[9]218,859	4.09
Per passenger car-mile	[1]9.0	[1]9.2	(D) 2.17	[2]4.8	[2]5.0	(D) 4.00	[9]6.4	[9]6.3	1.58
Ratio:									
Transfer passengers to revenue passengers (per cent)	28.5%	28.0%	1.78	17.3%	16.5%	4.84	8.8%	14.4%	(D) 38.89
Revenue car-miles	747,767,250	747,501,171	4.04	221,392,024	222,435,459	(D) .46	211,668,910	207,835,542	1.84
Per mile of single track	76,012	76,132	(D) 1.57	24,641	24,909	(D) 1.07	35,832	35,005	2.36
Per car operated	[4]36,898	[4]36,790	.29	[10]42,579	[10]44,365	(D) 4.02	[7]36,982	[7]37,370	(D) 1.04
Per car-hours	[5]8.9	[5]8.9	....	[5]10.7	[5]10.6	.94	[8]9.4	[8]9.3	1.07
Car-hours	79,221,419	78,993,517	.29	17,538,703	17,806,295	(D) 1.50	20,270,743	20,161,467	.54
Per car operated	[15]4,124	[15]4,112	.29	[16]3,885	[16]3,808	1.23	[17]3,984	[17]4,088	(D) 2.54

[1] 91 companies
[2] 109 companies
[3] 55 companies
[4] 84 companies
[5] 90 companies
[6] 89 companies
[7] 44 companies
[8] 50 companies
[9] 55 companies
[10] 82 companies
[11] 88 companies
[12] 86 companies
[13] 43 companies
[14] 48 companies
[15] 83 companies
[16] companies
[17] companies

$39,734 After Dividends for Baltimore Interurban

Actual earnings of the Washington, Baltimore & Annapolis Electric Railroad, Washington, D. C., for the year ended Dec. 31, 1924, applicable to interest on the funded debt were $713,135, or approximately 1.4 times the interest charges. Out of this sum $139,065 was set aside for depreciation and maintenance and $39,334 for amortization of discount on funded debt, with the result that after these charges and the payment of $516,205 for interest on the funded debt, there remained a balance of $18,529. To this there is added a profit and loss credit of $47,612, bringing the profit and loss for the year up to $66,142. Preferred dividends took $26,407, leaving the profit and loss at $39,734.

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

Year Ended Dec. 31, 1924

Operating revenue		$2,818,084
Operating expenses prior to provision for depreciation		2,017,303
Net operating revenue prior to provision for depreciation		$800,781
Taxes assignable to railway and other operations		117,085
Operating income prior to provision for depreciation		$683,695
Non-operating income (net)		29,439
Gross income for the year applicable to interest on funded debt		$713,135
Deductions from gross income:		
Interest on funded debt	$516,205	
Amortization of discount on funded debt, etc.	39,334	
Provision for depreciation	139,065	
		694,605
Net income for the year		$18,529
Profit and loss net credits during the year		47,612
Profit and loss gross surplus for the year		$66,142
Dividends paid (1¾ per cent on preferred capital stock outstanding)		26,407
Profit and loss surplus for the year		$39,734
Profit and loss surplus at beginning of the year		488,103
Profit and loss surpluse at close of the year		$527,837

The report is not only the report of the Washington, Baltimore & Annapolis Electric Railroad but includes also the operations of its subsidiaries—the Annapolis & Chesapeake Bay Power Company, the Terminal Real Estate Company and the Maryland Development & Realty Company of Anne Arundel County. The last two named corporations are minor companies, adjunctive to the parent corporation. But the first one, the Annapolis & Chesapeake Bay Power Company, which one commentator says "has contributed this additional sum to the treasury for the year, gives promise of becoming a powerful factor and a large earner for the parent company."

In the operation of the railway system proper the per-car-mile earnings for 1924 dropped to 52 cents, as against 54.3 cents in 1923, and 56.13 cents in 1922. It must be borne in mind, however, that the company applied to the Public Service Commission of Maryland about the middle of the year for an increase in passenger and freight rates to offset substantial increases in employees' wages and the benefit of these fare increases did not accrue to the company until the latter part of the calendar year. Among current assets the company shows cash of $215,688 and marketable bonds valued at $408,390.

Detroit United Affairs Being Discussed

Expectations Ahead That Refinancing Plan May Be Submitted Soon—Receivership Action in Best Interests of Everybody—Railway and Bus Articulation Program Proceeding

NOTHING tangible, nothing definite, has been done toward working out a financial program for the Detroit United Railway for the future. It is true there has been some discussion among large Canadian holders of the stock of the company in regard to the best course to be pursued, but that is as far as matters have gone. New York financial interests in intimate contact with the affairs of the company anticipate possible action in the near future, but events are shaping themselves slowly so that the program finally decided upon may be made to care adequately for the future.

In this connection opinion in New York reflects the very meager information from Toronto that an assessment of stockholders is in prospect. The extent of this assessment is not certain, but it may possibly be as much as 33⅓ per cent. At first appearance this might seem to be a heavy burden, but it would only be so relatively. Large holders of stock are said to be agreed that this is the best way out, and indications point to a possible definite statement being made soon to all the stockholders.

An assessment such as has been suggested would require present holders to contribute an additional $5,000,000, but the raising of this sum would permit the company to meet obligations necessary to be got out of the way and at the same time would provide funds to carry out unimpeded the program for rehabilitation, with which the sponsors for the bonds are in accord.

It is in the interest of the stockholders more so than it is of the bondholders that the system be preserved as a whole. In fact, the application for the appointment of receivers was presaged on this very need. As a means to this end the Yellow Coach Manufacturing Company acted in an entirely friendly capacity as a party to a proceeding that was perfectly logical and thoroughly in keeping with precedent in similar cases, notably the railway receiverships in New York and Pittsburgh and more recently the action in the case of Union Traction Company of Indiana, in all of which preservation of the rights of every one concerned was sought to be achieved *pari passu* through a particular creditor acting in behalf of himself and others.

At the time of the receivership every effort was made to emphasize the friendly nature of the proceeding, but it has since come to the attention of the railway management that an effort had been made in some quarters to attach to the purely friendly proceeding of the Yellow Coach Manufacturing Company an onus for what it did that does not square with the facts. As a result T. P. Pinckard, president of the People's Motor Coach Company, affiliated with the Detroit United, and other officers of the company have had occasion to put themselves formally on record with respect to the receivership proceeding to the end that the matter shall be thoroughly understood. After making full acknowledgment of the invaluable service of the operating experts of the Yellow Coach Manufacturing Company, and above all of the very liberal terms and conditions upon which all of the bus negotiations were made, without which it would have been almost impossible for the coach operations to have been undertaken. Mr. Pinckard says that even in the face of the possibility of the manufacturer suffering large losses the attitude of the Yellow Coach Manufacturing Company "was as favorable and as helpful as it has always been, and I defy any one to face me with the accu-

STATISTICS OF OPERATION OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

CAR-MILES

	On W., B. & A. E. R.R. Tracks	On Tracks Operated Under Contract	Total
Passenger	4,292,886	429,467	4,722,353
Freight	251,333	20,316	271,649
Service	10,070	....	10,070
Totals	4,554,289	449,783	5,004,072

All car-miles are based on our standard equipment, viz., 40-ton cars.

REVENUE PASSENGERS CARRIED

1924	1923	1922	1921	1920	1919
4,429,387	4,644,472	4,570,996	4,692,860	3,992,991	4,608,875

EARNINGS

	1924	1923	1922	1921	1920	1919
Per car-mile (cents)	52.00	54.30	56.13	53.60	53.48	47.28
Per miles of track operated	$17,763	$18,152	$18,248	$18,841	$19,907	$20,875
Per mile of road	$32,212	$32,916	$33,092	$34,173	$38,077	$39,450
Per passenger (cents)	46.76	45.58	46.98	45.97	44.27	41.03

STATEMENT OF MILEAGE

	On W., B. & A. E. R.R. Tracks	On Tracks Operated Under Contract	Total
Miles of single track	73.524	6.667	80.191
Miles of second track	40.934	6.667	47.601
Miles of sidings and turnouts	18.8708	......	18.8708
Total mileage operated	133.3288	13.334	146.6628

Includes Annapolis Short Line.

sation that it has pursued other than an honorable and a self-sacrificing course throughout the entire matter."

Other officers of the railway are no less insistent. Sir Thomas Tait, vice-president of the railway, is on record to the effect that the petitioner "acted throughout the whole affair in a most friendly, generous and constructive manner." As one of the directors who had to do with the negotiations, he says that the assistance and co-operation of the manufacturer in the matter "merit thanks and appreciation."

Thomas G. Long of counsel for the railway also has gone similarly on record.

Mr. Long has said:

> When toward the end of the first week in March, the affairs of the railway became critical, the most serious question confronting those then handling the affairs of the railway was just where they could look for friendly co-operation. The suggestion of Mr. Babcock, secretary and treasurer of the Yellow Coach Manufacturing Company, that the Yellow Coach Manufacturing Company would be glad to file a petition for a receivership for the protection of all concerned was a great relief to all of us. It was very apparent to all of us that no action other than an equity reecivership could protect the situation.

So much for that phase of the matter. As to the future, some aspects ahead have already been touched upon. Current earnings of the system are holding up well. There is still a considerable measure of duplication of service, but that will be corrected just as soon as the bus and the railway services can be articulated to the best advantage. This is a matter of experiment. Despite the need for conservative management there is apparently no desire on the part of the officials to push one type of service at the expense of the other. Indeed, that would in no way solve the problem.

Not every one may be inclined to agree with the opinion recently expressed that "if the motor bus development of the company had got under way twelve months earlier a receivership would not have happened as it did," but this is the opinion of a disinterested observer writing recently in the *Wall Street Journal* from Detroit. This same unusually well informed authority says that taken by and large the situation of the Detroit United appears to be simply one of a famine in working capital occurring in the midst of an important evolution in its business. This famine in working capital would be promptly corrected under the assessment plan suggested, which, as has been pointed out, would preserve the property as a whole and increase the equity of the stockholders who do their part.

Wants to Abandon Line in Troy

The United Traction Company, Albany, N. Y., applied to the Public Service Commission on April 27 for permission to abandon its Oakwood Avenue line in Troy. H. B. Weatherwax, president, said that the paving program of the city would cost the company approximately $54,000; that the line had never been operated at a profit, and that there was no reasonable prospect that in the future sufficient revenue could be obtained from its operation to pay its proper proportion of expenses of operation, taxes and interest.

The company offered to serve the territory with buses at a rate of fare to be the same as might from time to time be charged by the United Traction Company on its trolley lines in Troy, with interchangeable transfers.

Seattle-Rainier Purchase Brings Up Many Points of Difference

In the opening conference between representatives of the city of Seattle and officials of the Seattle & Rainier Valley Railway, on the proposed purchase of the traction company's system by the city, the two groups of officials questioned the correctness of the appraisal set by the experts for the city. Walter M. Brown, general manager of the company, held that the city's appraisal of $1,045,547 was $500,000 too low. Another question which Mr. Brown says he will bring up is the interest paid by the company on construction bonds. He also pointed out that in the city's appraisal no allowance was made for franchise value, engineering, legal and general expense.

Mr. Brown also questioned the value placed on the company's steel cars. These items will all be considered at a second meeting in the near future.

The appraisal value set by the recent survey of the utilities department is $210,000 higher than an apprasial made of the same property a little less than five years ago by City Councilmen.

The detailed appraisal shows that the gross revenues of the line in 1924 were $34,000 less than in 1923. A report made by D. W. Henderson, superintendent of the Seattle Municipal Railway, showed that the gross revenues for 1923 were $460,609 and the operating expense $302,719, leaving a total of $157,889 as operating income, from which $110,380 was to be paid in real and personal taxes and interest on delinquent taxes. The report of Mr. Henderson set forth that by the elimination of taxes and other items the city could operate the lines $200,000 cheaper than could the private concern.

Value Reduced.—The capital value of the Youngstown Municipal Railway, Youngstown, Ohio, has been reduced $35,038 by the City Council. This is the result of returning the North Avenue power station to the Pennsylvania-Ohio Power & Light Company. Reducing the valuation saves approximately $2,450 a year in interest.

Partial Abandonment Petition Before Commission. — The Alabama Power Company has applied to the Public Service Commission for permission to abandon and dismantle its railway service and tracks in Anniston, Ala., on Moore Avenue between Thirteenth Street and Tenth Street and on Tenth Street between Moore Avenue and Noble Avenue.

No Dividend in Stock for American Light & Traction.—The American Light & Traction Company, New York, N. Y., has declared a quarterly dividend of 1¾ per cent in cash on the common stock, payable on May 1 to stock of record April 15. Heretofore the company has paid 1 per cent in cash and 1 per cent in common stock quarterly on the common. The regular quarterly dividend of $1.50 was also declared on the preferred, payable May 1 to stock of record April 15. The company's common capital stock has been increased since June 30, 1909, from $8,279,100 to an amount now outstanding of $32,195,000, practically all of which has been paid in at par through the medium of stock dividends issued against undivided surplus.

Earnings of Main Road Off.—March recorded the largest drop in gross revenue since the 8-cent fare went into effect on the Portland Railroad, Portland, Me., operated by the Cumberland County Power & Light Company. Revenue from the railway department during March was $132,808. This represented a decrease of $19,647 over the revenue from the same department in March, 1924. For the first three months of the current year the gross revenue has been $410,413 and the decrease in returns as compared with the first three months of 1924 has been $43,284. This condition is attributed in part, and particularly in March, to the open winter, the unusually warm weather, and the tremendous increase in number of automobiles purchased.

Seeks to Abandon All Railway Lines.—The Union Traction Company, Santa Cruz., Cal., has applied to the Railroad Commission for authority to abandon operation of its remaining railway facilities between the intersection of Mission Street and Pacific Avenue and a point opposite the Casino, and to abandon service thereon. The company was previously authorized by the Railroad Commission, subject to approval by city officials, to abandon service on its Cliff Drive line, but the City Council refused to act, stating that when the company desired to abandon all its service it would grant the necessary authority.

Salt Lake City Company Reports for 1924.—Operating income of the Utah Light & Traction Company, Salt Lake City, Utah, for 1924 is shown in a report filed with the Public Utilities Commission of Utah to have been $373,608. This, including taxes for the year paid, is 4.16 per cent of the valuation of the company as set up by the commission for rate-making purposes. The statement shows railroad operating revenues for the year of $1,853,000, about $5,000 less than in 1923. Operating expenses, however, increased $8,000. Taxes, $129,100, were $6,300 less than in the previous year. The report shows a non-operating income from rental of the power plant of the company and the gas equipment at Ogden of $535,000, an increase of $43,000 as compared with the previous year. Gross income, therefore, was $910,000, while fixed charges included $841,765 as interest on funded debt; $67,589 other interest, and $15,168, amortization of discount on the funded debt. This leaves a deficit in the income for the year of $14,159. The increase in the operating expenses is more than accounted for by an increase of $74,000 in expenditures on the equipment. Correspondingly, the expenditures under the heading cost of conducting transportation were reduced $54,000 in the one year, of which $51,000 was reduction in the total paid to passenger conductors, motormen and trainmen.

Legal Notes

Federal District Court.—*Review of Valuation by Public Utilities Commission.*

The District Court will not review the valuation of a public utilities commission of the property of a utility, but will merely determine whether the valuation and rate fixed by the commission are confiscatory. If they are confiscatory, it is for the commission and not the court to make the correction. (Ohio Bell Telephone Co. vs. Public Utilities Commission, 3 Federal (Second) Rep., 701.)

Federal Supreme Court.—*Determination of Reproduction Value and rate of Return.*

Reproduction value should include a reasonable allowance for organization expenses, interest during the construction period, and other overhead charges which necessarily would be incurred in reproducing the utility. Proof of actual expenditures for these purposes, while helpful, is not indispensable. A rate which allowed this utility less than 5 per cent on the value of its property was confiscatory. (Ohio Utilities Co. vs. Public Utilities Commission of Ohio, 45 Supreme Court Rep., 259.)

Federal Supreme Court. — *Operation at Loss Does Not Warrant Abandonment of Part of Lime.*

A public utility cannot, because of loss, escape obligations voluntarily assumed. The fact that a company must make a large expenditure in relaying its tracks because of change of grade and expects a deficit from operation does not render the order void. The company is at liberty to surrender its franchise and discontinue operation throughout the city, but it cannot continue to enjoy its franchise and escape from the burden incident to its use. (Fort Smith Light & Traction Co. vs. Bourland et al, 45 Supreme Court Rep., 249.)

Federal Supreme Court.—*State Statute Prohibiting Interstate Operation of Bus a Violation of Commerce Clause.*

The plaintiff wished to operate an auto-bus line between Seattle, Wash., and Portland, Ore., and obtained an Oregon license. His certificate of public convenience and necessity in Washington was refused by the State Director of Public Works under the laws of state, which declared such a certificate may not be granted for any territory already adequately served by the holder or holders of existing certificates. State regulations, which are adopted primarily to promote safety on the highways and conservation in their use are not obnoxious to the commerce clause, provided the indirect burden imposed by them upon interstate commerce is not unreasonable. But a state law, which prohibits competition and allows the use of the highways to some but not to others and permits state officers to determine whether the facilities for conducting interstate commerce are adequate, is forbidden by the commerce clause of the United States. (Buck vs. Kuykendall, 45 Supreme Court Rep., 324.)

Kentucky.—*Injury to Automobile Inclosed by Curtains.*

Where a motorman did not signal by bell or horn to an automobile on the track, when that automobile was fitted with curtains which obscured the sight of the driver, the motorman was guilty of negligence. (Price vs. Kentucky Traction & Terminal Co., 269 Southwest Rep., 303.)

Missouri.—*Street Workman and Humanitarian Rule.*

While the humanitarian rule will not ordinarily be applied in all its strictness to section men or track men whose business is to keep tracks of railroads and street railway companies in repair yet where work had been carried on in a street for some time, so that motormen should know that laborers were repairing the pavement near the track, an instruction permitting a verdict in favor of such a laborer on the hypothesis that the motorman saw "or by the exercise of ordinary care would have seen" him in a position of peril in time to avert the injury was upheld. (Thomas vs. Wells, 267 Southwest. Rep., 46.)

New Jersey.—*Burden of Proof of Negligence.*

A passenger complained that while stepping from the lowest car step to the ground, she received a shock from currents which were permitted to leak to the step of the car, and when asked how she knew it was an electric shock, she said she felt the same sensation as when using electric batteries for the cure of rheumatism. The court held that unless the defendant was able to rebut this testimony, the jury was entitled to draw the inference of negligence. (McKittrick vs. Public Service Railway, 128 Atlantic Rep., 226.)

Pennsylvania. — *Passenger Injured While Entering Left-Hand Door.*

A passenger signaled a trolley car which stopped. The passenger then indicated her intention to board it by the usual right-hand rear-entrance. The conductor refused to admit her there and opened the left rear door because the car was on the side of the highway and the ground on the left-hand side was higher. While the passenger was boarding the car on this side, she was struck by an automobile. The company claimed that the automobile driver was the only one negligent and the Supreme Court of Pennsylvania affirmed this view. [Martin vs. Philadelphia R. T. Co., 127 Atlantic Rep., 765.]

Rhode Island.—*Liability for Cost of Strengthening Bridge Over Railroad.*

The Public Utilities Commission was held to have jurisdiction after proper hearing, to order a steam railroad to repair or reconstruct the framework of a bridge over its right-of-way so as to permit the location thereon of a second street railway track, subject to the requirement that the street railway pay the expenses incident to this extra burden. (United Electric Railway vs. City of Cranston et al, 128 Atlantic Rep., 213.)

Tennessee—*Anti-Trust Act Is Inapplicable to Public Utility.*

Because of consolidation and various energy purchase contracts, several power plants in Tennessee were shut down. The attorney general brought suit under the State anti-trust Act on the ground that there was a monopoly in the production, distribution and sale of commercial electricity. The Supreme Court held, however, that utility companies subject to the control of the Public Utility Commission did not come under the Anti-Trust Act, as their prices are subject to the power of regulation and control by the state. (State ex rel. Thompson vs. Nashville Railway & Light Co. et al., 268 Southwest Rep., 120.)

Vermont. — *Power of Public Service Commission Limited.*

The Public Service Commission of Vermont has only such powers as are conferred upon it by the Legislature. It has no power to relieve a railway of the duty of maintaining its tracks in a city street and no power to authorize the railway to abandon operation on part of its lines. Where a railway threatens to discontinue a service, the town affected may apply for relief to the Chancery Court, which will decide whether a temporary or a permanent injunction shall issue. [Town of West Rutland vs. Rutland Railway, Light & Power Co., 127 Atlantic Rep., 882 and 883 (two cases).]

Virginia—*Power of State to Fix Rates and Permit Railway to Abandon Line, Notwithstanding Contract with City.*

Under the Virginia constitution, though the State may confer on a city the power to contract as to rates of public service corporations using the streets, the State may change the terms of such contract between city and utility through the exercise of its police power. Such a regulation by the State does not impair the obligation of contracts between the city and the public service corporation, since the contract was entered into, subject to the State exercise of police power. The State may also, under proper condition and to avoid confiscation, permit a street railway to abandon facilities. Under the Federal Constitution, a street railway cannot be obliged to continue operation of a particular line, where such continued operation would result in the confiscation of property, and therefore the taking of property without due process of law. [City of Richmond vs. Virginia Ry. & P. Co., 126 Southeast Rep., 353, also City of Portsmouth vs. Same (two cases), 126 S.E. Rep., 362, 366.]

West Virginia. — *Repudiation of Release.*

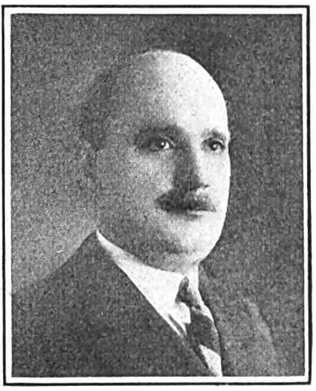
In an action for damages for personal injuries, the plaintiff cannot repudiate a written release of all claims arising out of his injuries on the ground of fraud or mental incompetency to contract, unless he returns everything of value received by him in consideration for the release or offers to do so. (McCary vs. Monongahela Traction Co., 125 Southeast. Rep., 92.)

Personal Items

Former Receiver Heads Road

H. J. Sheeran in Charge of Reorganized New York Surface Line—Started Career at Bottom

Hugh J. Sheeran has been elected president of the New York Railways Corporation, New York City, the successor to the New York Railways under receivership and foreclosure. Announcement to this effect was made on April 24 as part of a statement for publication in the newspapers that day. The fact that the receivership was to end on May 1 was front page news, despite all the recent big events of national and international importance. Right in the center of the story about the termination of the receivership, but credited to Mr. Cotton as the spokesman for the protective committee of security holders, was the announcement about Mr. Sheeran. In his very brief official statement Mr. Cotton said: "Mr. Sheeran is a remarkable operating man who has risen from the ranks. He is only 42 or 43 years old, but he has demonstrated great capacity in running these roads."



H. J. Sheeran

This was a fine compliment, paid by one of New York's most noted specialists in corporation law. Twenty-five years ago Mr. Sheeran, just now very much in the public eye, walked into the office of the old Metropolitan Street Railway in the Cable Building, 621 Broadway, in search of a job. It is the same building in which Mr. Sheeran now holds forth as president of the successor company and as president of the Manhattan Surface Coach Company, organized to handle the bus business which the reorganized corporation intends to develop.

Mr. Sheeran was then less than 17 years old. At the head of the railway at that time was H. H. Vreeland, then, as now, a great believer in young men. In coupling up with the railroad, "Hughie," as he is familiarly known, followed in the footsteps of his father, an employee of the company. As his associates at one time or another Mr. Sheeran has worked side by side or in close touch with nearly all the present officers of the New York Railways and the Interborough Rapid Transit Company and with Oren Root, Frederick T. Wood, L. H. Palmer and Freddie Dell, all now well known in railway circles, to mention just a few.

He went to work in the operating department. Very early in his career Mr. Sheeran manifested a keen aptitude for figures and statistics of all kinds. In fact, the remark: "Ask Hughie, he knows," became part of the lexicon of the Metropolitan Street Railway office long before a clever advertising man caught up a similar expression and turned it to a use considered by some to be a base one. Not only that, but Mr. Sheeran had meanwhile learned to make pothooks and to interpret them correctly, a feat many business men were inclined to regard as impossible of achievement in the days before writing by character instead of letter had been reduced to its present science. This further stamped him as being thorough.

On the foundation thus laid was the structure reared. Mr. Sheeran's progress cannot be followed in all its details. He passed not rapidly but gradually through all the intervening jobs, mastering each as he advanced, until on the appointment of the late Job E. Hedges as receiver he was made assistant secretary to Mr. Hedges. The next natural step was to the post of secretary to the receiver. Frank Hedley, president of the Interborough, was the general manager for the receiver, but he relinquished the post with the surface railway because of the pressure of his other duties. Mr. Sheeran succeeded him. Then when Mr. Hedges fell ill and was forced to retire from active business the financial interests back of the company named Mr. Sheeran to succeed him.

Mr. Sheeran does not shy at a new idea. Witness his recent plea for bus operating rights in downtown Manhattan. It is one of the most comprehensive plans of the kind so far proposed. If, as and when this plan goes through, said advisedly considering the New York political situation, Mr. Sheeran can be counted upon to do the job thoroughly.

In the meantime Mr. Sheeran is carrying on successfully with the 75 miles of conduit surface lines under his jurisdiction. In discussing the outlook for the railway Mr. Cotton said he was "feeling exceptionally good over the whole situation." Everything considered, but particularly the fact that the destiny of the road is in Mr. Sheeran's hands, no reason is apparent why he should be anything but optimistic.

George M. Taylor has been elected vice-president and Daniel Stafford assistant secretary and treasurer of the Virginia Railway & Power Company, Richmond, Va.

Mr. West in Salt Lake City

Former Denver Tramway Official Has Already Entered Upon His New Work

Edward A. West, the new general manager of the Utah Light & Traction Company, Salt Lake City, Utah, left his previous post, that of general superintendent of the Denver Tramway, with this expression of gratitude from his co-workers in the executive offices of the tramway: "Merit has won and we wish Edward A. West all the good things he deserves."

Officials of the tramway give much credit to Mr. West for his handling of its affairs during the trying times of the last few years and his leadership when the then Mayor of the city took the stand that the company could not obtain more than a 5-cent fare, despite the fact that war-time prices were being charged everywhere else. This case the company won only after it had been carried to the federal court.

During the years of 1909-1913 Mr. West was assistant to the chief engineer and general superintendent of the Portland Railway, Light & Power Company, Portland, Ore. From 1913 to 1916 he was efficiency engineer for the same company. From Portland he went to Denver as chief engineer of the Denver Tramway, the appointment being made in April, 1916. He was made general superintendent of the Denver Tramway on Jan. 1, 1919.

E. A. West

Mr. West was born at Wiarton, Ont., on Nov. 5, 1882. He was graduated from Tufts College as a mechanical engineer, and then took a two-year course in electrical engineering at the Massachusetts Institute of Technology.

Promotions in Engineering Staff at Hampton

N. E. Drexler, formerly chief engineer for the Newport News & Hampton Railway, Gas & Electric Company, with office at Hampton, Va., has been made acting manager of the gas and electric departments of that company.

J. W. Howard, formerly assistant chief engineer, has been promoted to engineer.

Leo Kelly, chief engineer for some time, has been made assistant chief engineer.

Obituary

F. N. Root

Fred N. Root, president and general manager of the Root Spring Scraper Company, Kalamazoo, Mich., died on April 10, following an operation. Mr. Root had been in failing health for the last few years, having had a very serious operation in 1921. His last illness dates from Thanksgiving, since which time he had been confined to his bed, although hopes were at first held out for his recovery.

For the last 30 years Mr. Root had been head of the Root Spring Scraper Company, which he organized and finally incorporated in 1921. He held many valuable patents on snowscrapers and life-guards and his products were well known in the railway field.

Mr. Root was born in Kalamazoo on May 25, 1850. His father was a Kalamazoo pioneer, having built the tollgate roads, and was head of the first bus company in Kalamazoo. Mr. Root attended Devoe College at Niagara Falls, N. Y., and later entered business with his father at Kalamazoo. After the death of his father, Mr. Root entered the ice business. He was at one time president of the Kalamazoo Ice Company.

Mr. Root had been a regular attendant at the railway conventions for the last 30 years. He enjoyed a large circle of friends and acquaintances, by whom he was admired for his sterling qualities and business integrity. Mr. Root's son Newton and his daughter will carry on the business.

Sir Augustus Nanton, formerly president of the Winnipeg Electric Company, Winnipeg, Man., successor to the Winnipeg Electric Railway, and a leading Canadian financier, died on April 24 in his home in Toronto. In the course of his life of 65 years he held many prominent positions. Because of his removal to Toronto to become president of the Dominion Bank he resigned as president of the Winnipeg Electric Company on Dec. 15, 1924, but continued as a member of the board. Sir Augustus had been connected with the affairs of the Winnipeg property since 1898. Upon his retirement from the office of president he was presented with an illuminated address signed by the directors and executive officers, gratefully acknowledging his valued services. He was succeeded as president by George W. Allan, K. C.

Charles Woodward Lamb, advertising counselor for the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., died April 16 at Milwaukee. He entered the service of the Milwaukee property in 1906 as right-of-way agent for the real estate department.

Stephen S. Emery died recently at Allentown, Pa. He was interested in the building of the Norristown & Lansdale Electric Railway, which was afterward absorbed by the Lehigh Valley Transit Company. After this road was built he transferred his interests to the Chambersburg & Gettysburg Electric Street Railway.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Warns Against Timber Waste

Practical surveys of the timber situation of the country show that half of the waste of timber could be prevented. It is known that one-sixth of the entire timber consumption is lost through decay. In the field of ties, fence posts, mine timber, poles and piling the preventable waste is said to equal 600,000,000 cu.ft. of wood a year that might be saved by proper preservative treatment. *Wood Preserving News* for March says that the matter demands attention by chemical engineers. Railroads, telephone companies and other large users are beginning to take up tie preservation and pole treatment, but the vast majority of wood users themselves have not given any consideration to the purchase of treated timber or the treatment of timber. *Chemical and Metallurgical Engineering*, a McGraw-Hill paper, warns purchasing agents and managers of corporations, as well as engineers, to make use of developments of creosoting and zinc chloride treatment, if they hope to escape the necessity of having to pay in the near future two or three times as much for wood supplies as would have been necessary had care been taken to use with economy those stocks which today are being consumed.

Twin City Company Active in Car Building

Four of the new type street cars built by the Light-Weight Noiseless Electric Street Car Company, Minneapolis, Minn., will be sent to Stillwater for use on that suburban line and five for use by the Duluth Street Railway, Duluth, Minn. They weigh 24,000 lb., as against 40,000 to 52,000 lb. for the old cars. The cars seat 44, are 36 ft. long and 9 ft. wide, have four 24-hp. motors, front entrance and rear exit and interlocked door and control.

George H. Tontrup Corporation Organizes

George H. Tontrup, who for the last 30 years has been identified with the business of general supplies for railways and manufacturers, has again taken up his activities after a short absence. The George H. Tontrup Corporation has been organized with offices at 953 Third Avenue, New York City, to handle the exclusive agency for the Acme Motor Coach Company, Cadillac, Mich., to the electric and steam railroads of the country. As president of this new organization Mr. Tontrup is prepared to negotiate with all transportation companies for Acme buses, both of the street car pay-enter type and the sedan or coach type. The George H. Tontrup Corporation will handle a complete line of supplies for electric and steam railways. It is direct factory representative for the Eastern district for the Grimm Metal Sign Corporation and the Silica Enamel Sign Company, manufacturers of metallic signs of every description. The company specializes on curb and sidewalk "bus stop" signs, and also all types of safety zone signs for railway service.

Westinghouse Air Brake Reports Satisfactory Operations

After providing from earnings for federal and other taxes, dividends and depreciation, the consolidated surplus of the Westinghouse Air Brake Company, Wilmerding, Pa., for the year 1924 increased from $10,360,865 to $11,611,087. H. H. Westinghouse, chairman, in his message to the stockholders states that although business was below normal in many lines during 1924, the operations proved fairly satisfactory and on Jan. 1, 1925, the company had practically the same value in unfilled orders on its books as at the beginning of 1924. The Canadian company's operations for the year were very satisfactory and reports recently received from the foreign companies indicate that the confidence restored by the adoption of the Dawes plan has improved their business outlook to a marked degree. The annual meeting of the stockholders was held at the general offices of the company, Wilmerding, on April 14.

Rolling Stock

Pittsburgh Railways, Pittsburgh, Pa., has placed an order for 103 new cars, comprising 83 safety city cars and twenty interurban cars. Specifications for the twenty interurban cars are very nearly the same as those for the city cars. The body weight is 1,000 lb. greater, making the total weight 40,000 lb. The seating capacity is two passengers fewer, being 50 when used as the forward car of a train and 54 when used as the second car. No fare boxes or registers are used. The seats are

Metal, Coal and Material Prices

Metals—New York	April 28, 1925
Copper, electrolytic, cents per lb	13.65
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.775
Zinc, cents per lb	7.32
Tin, Straits, cents per lb	56.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.50
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.00

finished in plush and fabrikoid instead of rattan. Trolley retrievers are used in place of catchers, and pilots are supplied instead of the lifeguards used on the city cars. Detailed specifications of the 83 cars are given in the following table:

Number of cars ordered	83
Date order was placed	March, 1925
Date of delivery	Summer, 1925
Builder of car body	Standard Steel Car Co.
Type of car,	Low floor-multiple-unit, safety city
Seating capacity (in train)	52 as first car 56 as second car
Weights:	
Car body with equipment	22,000 lb.
Trucks	17,000 lb.
Total	39,000 lb.
Bolster centers, length	21 ft. 8 in.
Length over all	45 ft. 0 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 1½ in.
Height, rail to trolley base	10 ft. 10½ in.
Body	Steel
Interior trim	Cherry
Headlining	Haskelite
Roof	Monitor
Air brakes	Westinghouse
Axles	4-in. forged steel
Bumpers	Hedley anti-climber
Car signal system,	Electric Service Supplies Company
Car trimmings	Statuary bronze
Center and side bearings,	P. R. Co. center, Stucki, side
Conduits and junction boxes,	Crouse-Hinds sheet steel
Control	Westinghouse HL
Couplers	Westinghouse K-1
Curtain fixtures	Curtain Supply Company
Curtain material	Fabrikoid
Designation signs	Illuminated
Door-operating mechanism,	National Pneumatic air engines
Fare boxes	Cleveland No. 4
Gears and pinions	Nuttal, helical
Hand brakes	Peacock, staff and staffless
Heater equipment,	Consolidated Car Heating Co.
Headlights	Dayton, U. S.
Journal boxes	Symington
Lightning arresters	Westinghouse K-3
Motors	Four Westinghouse 514-P, inside hung
Registers	International Type 10
Sanders	Nichols-Lintern, air type
Sash fixtures	Dayton
Seats	Hale & Kilburn
Seating material	Rattan
Step treads	Feralun
Trolley catchers	Ideal
Trolley base	Westinghouse 13-E
Trucks	Arch bar
Ventilators	Peerless and Perry
Wheels	26-in. diam.

Marion & Bluffton Traction Company, Bluffton, Ind., will purchase two new interurban cars. Authority to issue $32,000 in notes has been asked of the Indiana Public Service Commission for this purpose.

United Traction Company, Albany, N. Y., will order 42 new buses following the truce reached between the company and the city over the matter of rates of fare.

Cleveland Railway, Cleveland, Ohio, recently placed orders for 60 buses to go into service on the Cleveland streets July 1. Thirty of the buses are of the six-wheel, double-deck type with a capacity of 62 passengers. The other 30 are White single-deckers on Kuhlman bodies with a capacity of 29 passengers each. The double-deck buses are to be used on two main lines paralleling existing street car lines, one going east from the Public Square and the other west. A number of the single-deck buses will be used as feeders to the railway.

Kansas City Railways, Kansas City, Mo., will open bids on May 9 on the three styles of bus to be used in the new service. The request for bids was for 61 buses, including 40 single-deck buses, sixteen double-deck buses and five special parlor cars.

Track and Line

Philadelphia, Pa.—Director Ehlers of the Department of Transit has awarded a contract to the Keystone State Construction Company for the third section of the Broad Street Subway between Stiles and Filbert Streets at its bid of $16,863,436 and limited the amount to include extra work to $17,700,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will soon start reconstruction of its double-track line on Third Street from Chestnut Street to Galena Street. Completion of this improvement will give the company a new concrete structure for the full distance of the Third Street line, starting from the downtown section.

Portland Electric Company, Portland, Ore., has presented a proposal to the Multnomah County Commissioners by which the company plans to spend $120,000 in building a double track on the west side of the Greeley Street cut-off from Killingsworth Station to Stanton Street. This new track will connect with the Mississippi Avenue line.

Puget Sound Power & Light Company, Chehalis, Wash., plans to build a spur track into the fair grounds from the interurban line which runs near by. This will provide added transportation facilities for the Southwest Washington Fair, held at Chehalis, Wash., annually.

Seattle Municipal Railway, Seattle, Wash., plans to extend the 23d Avenue car line across the Montlake-Stadium bridge to the Stadium. Seattle banks recently purchased a $99,000 issue of 6 per cent railway utility bonds paying par and accrued interest for this construction.

Trade Notes

Brinard Sales & Construction Company, Inc., New York City, N. Y., railroad supply and equipment business, has been chartered at Albany with $10,000 capital. M. R. Briney, Brookhaven, L. I.; J. J. Hubbard, 55 South Seventh Street, Mount Vernon, N. Y., and Edward Shannahan, 582 Eleventh Street, Brookline, are the directors and subscribers. C. C. Cormany, 90 West Broadway, New York City, is attorney.

Industrial Works, Bay City, Mich., has announced that Lyle Marshall, former manager of the service department and later connected with the Chicago office, has been appointed district sales manager with new offices at 619 Dixie Terminal Building, Cincinnati, Ohio, also that James E. Shearer, assistant sales manager, has moved his headquarters from the home office to the New York office, 50 Church Street. George T. Sinks, in charge of the New York district, will remain in that position.

Chemical & Vacuum Machinery Company, Buffalo, N. Y., has announced that H. E. Neubauer, formerly assistant chief engineer of the Buffalo Foundry & Machine Company, later vice-president of O. S. Sleeper Company, Inc., has become associated with it as chief engineer.

Illinois Paving Brick Manufacturers Association Chicago, Ill., has announced that Lindsey E. Thompson has accepted a position as field engineer, with headquarters in Webster City. Until recently Mr. Thompson was sales manager of the National Sewer Pipe Company of Webster City, Iowa.

Gardiner & Lewis, Inc., New York, N. Y., has been succeeded by the Lewis Asphalt Engineering Corporation. The main offices of the concern—engineers and manufacturers specializing in protection against water and corrosion—continues at the old address, 30 Church Street, New York City. The change of name carries with it no change in ownership, management or policy, nor in the administrative and technical personnel. The officers of the company are: R. W. Lewis, president and treasurer; R. B. Reid, vice-president and general manager; J. W. Winkler, secretary. Frank Russell is sales manager at New York, C. W. Merriken at Chicago, and A. A. Gould at Cleveland.

General Electric Company, Schenectady, N. Y., paid in awards $39,531 to 3,244 employees during 1924 for suggestions which increased the efficiency of the company's operations. The suggestions ranged from those covering safety devices for the protection of workers to ideas on improved methods of manufacturing electrical apparatus, and the awards ranged from $1 to $1,000. In 1923, $22,988 was distributed to 1,752 employees and the highest award was $500. The awards may, at the option of the recipient, be paid in 8 per cent G. E. employees' securities corporation bonds.

Westinghouse Air Brake Company, Wilmerding, Pa., at the last annual meeting of its stockholders elected vice-president S. G. Down a member of the board of directors, filling a vacancy on the board created by the late Morris Rosenwald, Chicago. Mr. Down went with the company on Jan. 1, 1902, and the first duty assigned to him was that of an instructor on the instruction car. Since then he has advanced through the various positions of air brake inspector, mechanical expert, district engineer, assistant district manager, district manager, president of the Westinghouse Pacific Coast Brake Company and general sales manager, until he was elected vice-president in January, 1923, which position he now holds.

New Advertising Literature

General Railway Signal Company, Rochester, N. Y., has issued Bulletin No. 143, entitled "Signaling at the Age of Maturity," by Sedgwick N. Wight, commercial engineer. The subject matter in the bulletin was presented in the form of an address before the Signal Section of the American Railway Association on March 13, 1925. Because of the large number of requests for copies of the address it is presented in bulletin form.

Taylor Electric Truck Company, Troy, N. Y., has issued a small folder covering briefly its line of electric railway car trucks, and coil and elliptic springs for electric railway cars and buses.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 9, 1925 *Number* 19

Last Year's Operating Results Show Wide Differences

RESULTS of operation for the great bulk of American electric railways, compiled by the American Electric Railway Association and published in this paper last week, contain so much of real value that they should not be passed by without a careful and searching analysis. Considering the commercial and political situation during the year, the industry made a very creditable showing. It did virtually the same volume of business and at the same cost as in 1923, a much better year commercially.

Averages, however, do not mean much to the individual road. The question may well be raised as to what class of properties made the best relative showing for the year. Revenues naturally were greatest on city properties. These city companies included in the survey had operating revenues at the rate of $35,501 per mile of single track. Interurban lines, on the other hand, earned only $10,603 per mile. Even making allowance for the smaller investment and the easier operating conditions with lower cost, the showing is relatively poor. On a car-mile basis the earnings of the interurban properties showed up better. Gross revenues were 46.7 cents per car-mile on the city systems and 43.03 cents on the interurbans. Interurban passenger earnings were hard hit, and the balance was made up from freight.

Carrying the analysis somewhat farther, the best showing in the group of city systems was made by the medium-sized properties. Strangely enough, the largest city companies retained a smaller proportion of the gross revenue than did the middle-sized ones. This probably was due to the smaller effects of traffic congestion, permitting higher speeds. In the interurban field, on the contrary, only the companies in the group of largest gross earners were able to obtain any net income applicable to surplus or dividends.

Individual Attention to Earnings Problem Is Needed

CONDITIONS such as those pointed out in the above survey indicate that while the industry figures contain much general information, it is necessary to analyze each individual property if the industry is to be put in the best condition possible. For although the electric railways can be considered as a whole by the application of the law of averages, still each one presents an individual problem. Investors should not be asked to put their money into a proposition on the strength of a good general showing. Neither should they be scared off because in isolated cases the results are not satisfactory.

A step in the right direction was proposed by Executive Secretary J. W. Welsh in his last annual report, when he advocated community surveys of transportation. Knowledge of the transportation requirements in a community is essential if the local company is to render the most effective service, and incidentally is to obtain the largest return for its owners. The electric light and power industry and the telephone industry were pointed out by Mr. Welsh as examples of industries which have stimulated the public mind with the possibilities of extensions of service. This has been done as the result of a continual series of surveys through which the leaders have been in a position to know authoritatively what may be anticipated and to plan accordingly for the future. In like manner the electric railways can well afford to obtain similar information if they are to retain the prestige that they have enjoyed in the past and are to control local transportation in all its branches in the future.

Grand Rapids Car Competition Should Be Only a Beginning

NOT for many years has so much attention been paid to car construction as it is getting at the present time. While there has been a gradual development from the light single-truck car through the heavy double-truck car, back to the single-truck and now again the double-truck, there has been but little attempt to introduce radical innovations. Neither has there been a tendency to take the car-riding public into the confidence of the management and let the people be the judges of the vehicle. This plan, which is now being tried out in Grand Rapids, Mich., has much to commend it.

Competition in car design likewise shows a healthy condition. Few people inside or outside the industry believe that the ultimate in cars has been produced. Still, there has never before been a direct competition among three car builders to produce a vehicle which will vie with its competitors for public favor.

The conditions of the competition were simple. Light weight, noiselessness, comfort and an element of novelty to attract the public were the principal things aimed at. These are all desirable characteristics. In many cars, even recent ones, one or more of these things has been neglected, either to reduce cost, or because the management was blinded to the possibilities of the street car as a vehicle by the old fetish of "local conditions."

In the present competition the builders were given quite wide latitude. The three cars submitted are all double-truck, single-end, one-man, two-man designs. Those requirements of course limited the possibilities somewhat. But even so, there have been great opportunities for departure from existing standards. Specifications of the three cars show that advantage has been taken of many of these. Low floor, comfortable seats, good illumination, quick-acting band brakes, trucks and mechanical equipment designed to reduce noise, are but a few of the points given special attention by the builders.

Results will be watched with interest by other railway men. Whether or not the riding public chooses the best of the three cars, it will be an honest choice. Then, knowing what features meet with the approval of the people, the car builders will be in a position to go ahead and build cars that will be a still further advance over existing types. For only in this way can the best be brought out—and in the end the car rider will be judge of what is best.

Municipal Road Seeks to Sell Its Wares

SEATTLE has had a terrible time with its municipal railway. The supporting evidence is at hand at every turn, but it is not necessary here to marshal the distressing facts. All kinds of experiments have been tried in the way of fares, but to little or no avail. Things are better than they were some time ago, but they are still far from satisfactory. The road is as good as the limitations imposed upon Superintendent Henderson permit him to make it, but there is an excess of capacity which he desires to see fully used. So he is going in for advertising. In this he will be following the progressive moves of the Detroit Municipal Railway and of private companies. His avowed appeal will be to the owners of automobiles that they make greater use of the railway and desist from the practice of offering free rides. The street railway at Seattle is the people's road, but if they are conscious of that fact—and they ought to be—many of them still appear to be content to go their way ignoring it, except when the weather dictates another course or when their own private vehicles have been put out of the running because of the need for major or minor repairs. Mr. Henderson is sufficiently well informed to conduct the intended campaign intelligently and forcefully. In view of the selfish interest that the residents ought properly to have in their own road it will be interesting to see whether the measure of success that attends his effort is greater than that which has attended similar efforts on the part of privately operated companies to induce greater riding.

Group Conference Educational Plan Widely Applicable

PRACTICALLY six hundred certificates were awarded to employees who attended the series of departmental group conferences given by the Boston Elevated Railway this season.

This event, chronicled in an unobtrusive news note, marks the completion of a program which grew out of a definite need felt by the employees of the Boston Elevated for expert information regarding their everyday work. Planned at first for a small expected registration, the group conference idea so appealed to the men and women that more than a thousand enrolled in one or more of the five groups organized. Of these the number who completed the work is creditable when the exigencies of railway duties through a New England winter are considered. Credit for this result must be given to Edward Dana, general manager, and his department heads. Their vision and persistence overcame all difficulties. What the Elevated has done other railways can do, and they are urged to try the so-called "group conference plan" unless they have something better.

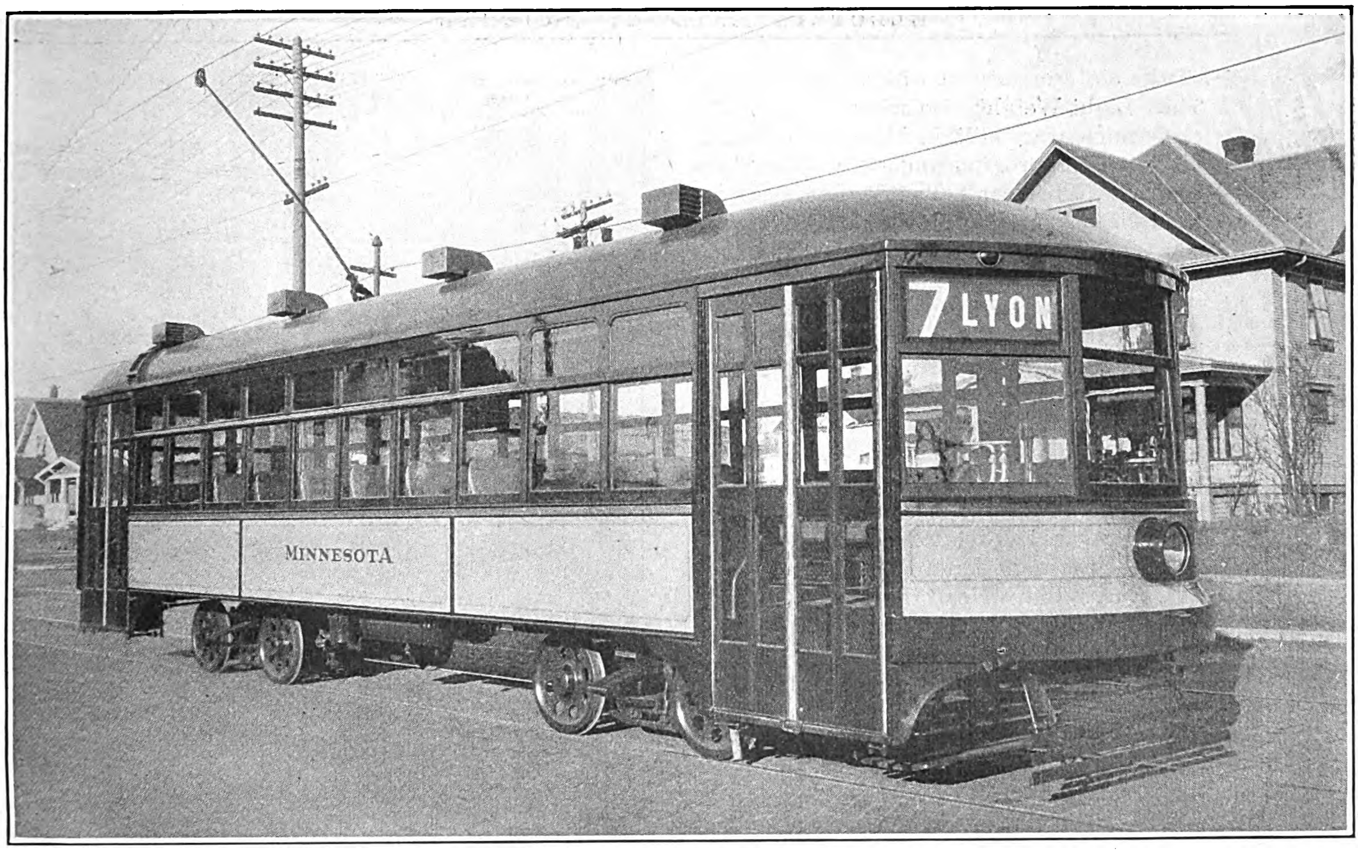
Care Should Be Taken in the Use of Buses

EVEN though numerous electric railways are constantly increasing motor bus operations there are many that have not as yet taken to buses as a means of providing transportation either as feeders to their street railway systems or as independent lines. There are still others which, while already operating buses, have not extended their use. Some of these companies may justly be criticised for not developing bus operation, although others have shown good judgment in refraining from or limiting their use. Bus lines should not be started in communities that are adequately served with street car tracks, nor should lines be started in territories not likely in the near future to be built up to a point warranting the service. In other words, good judgment should not be forgotten simply because of a desire to operate buses.

The street railway manager who several years ago recognized the possibilities of the bus and realized that the street car was not the only means of transportation was ahead of the one who could see the bus only as an enemy. Many of the latter have since become users of the motor bus. One sometimes wonders if perhaps they are not now becoming over-enthusiastic and are operating buses where there is no real justification, just to demonstrate their conversion. Few companies are finding their bus operations profitable in themselves. In many instances the balance of the system cannot afford to carry such an additional burden, although in some cases the bus may be used to give service with less loss than that occasioned with rail operation in non-productive territory.

When a bus line is started the public should have confidence in its continuance despite its ease of discontinuance. For that reason as much care should be exercised in starting a bus line as would be taken in preparation for a rail extension. Only through the establishment of such confidence will the public show a preference for the bus line proposed by a street railway in lieu of actual track extension or the bus proposal of an independent competitor. The ease with which a bus line can be discontinued has in some instances caused real estate operators to object to certain desirable trackage abandonments and the substitution therefor of buses, even though the service would be improved thereby. Rails and a trolley wire are tangible evidences of transportation facilities. The public must be taught that a street railway company's bus line is equally permanent. Therefore, it behooves the industry to be judicious in the selection of its bus routes so that they will be permanent and obtain public confidence.

The street railway is the backbone of transportation. Whenever possible, from a financial and operating viewpoint, it is best that service be furnished by rail, for it is the recognized means of mass transportation. The bus has shown that it can be part of a unified transportation system whether operated as feeder, independent line, or to provide a special service for those who prefer to pay a higher fare and obtain conditions not available in street cars. The demand for buses should not beguile the street railway operator into thinking it is the only transportation vehicle the public wants. The bus has its place. It is filling it admirably, and is here to stay. The mistake should not be made of thinking that a bus line must be started every time there is a petition for one.



The Sample Grand Rapids Car Built by the Light-Weight Noiseless Electric Street Car Company Is Painted in the Old Gold and Maroon Colors of the University of Minnesota

Many Innovations in Grand Rapids Cars

Light Weight, Reduced Noise, Attractive Appearance and Easy Riding Were Sought by Three Competing Car Builders Who Submitted Sample Cars—Truck Designs Include Many Novelties — Inside Journals, Roller Bearings and Fabric-Lined Clasp Brakes Are Used on All Three Designs—In This, the First of Three Articles, Is Described the Car Built by the Light-Weight Noiseless Electric Street Car Company

WITH the cars decorated with flags and motormen in chauffeurs' uniforms the Grand Rapids Railway Tuesday evening and Wednesday afternoon of this week formally demonstrated the three new electric coaches which will undergo tests here this spring and summer to decide what type of car the company will buy to replace some 40 cars lost in the carhouse fire of July 1 last. The three cars carried a group of men representing various railways and manufacturing companies. Wednesday, in addition to the officials, were carried city and county officials, prominent business men and leading citizens as guests of L. J. DeLamarter, vice-president and general manager Grand Rapids Railway. Opportunity was given them to travel on each of the coaches. The cars are ready for regular service and will be placed on various routes at once, the riders to decide which car they prefer by vote.

In general, the three cars are of the one-man, two-man type, arranged for single-end operation, and equipped with complete safety devices. Some wide departures from conventional car construction practice have been made for the purpose of trying out new ideas and introducing innovations which may help to stimulate further development. At the same time it was desired to introduce an element of novelty intended to attract car riders and overcome the tendency on the part of the public to look on the street car as an obsolete vehicle.

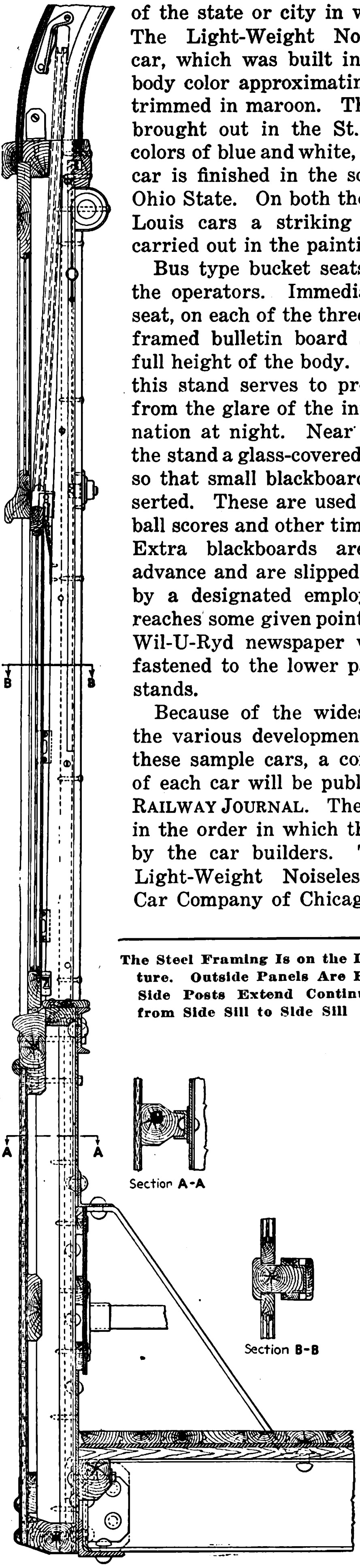
Departures from conventional design are particularly noticeable in the trucks. Inside journal boxes, roller bearings at the journals, fabric-lined clasp brakes on axle-mounted brake drums, hollow axles, automotive-type spring suspension, sound-deadened and cushioned wheels, sound-deadened gears, and many other similar innovations are included in one or more of the three trucks.

Likewise, many interesting features are incorporated in the body design and equipment. Light weight, noise reduction, passenger convenience and comfort, appearance and general merchandising value were the principal factors considered. Even the customary name has been changed. In a publicity campaign which is being undertaken in connection with the introduction of the new cars, they are referred to as "electric rail coaches" instead of street cars. All of this is for the purpose of stimulating interest, which it is hoped will increase riding and attract new business.

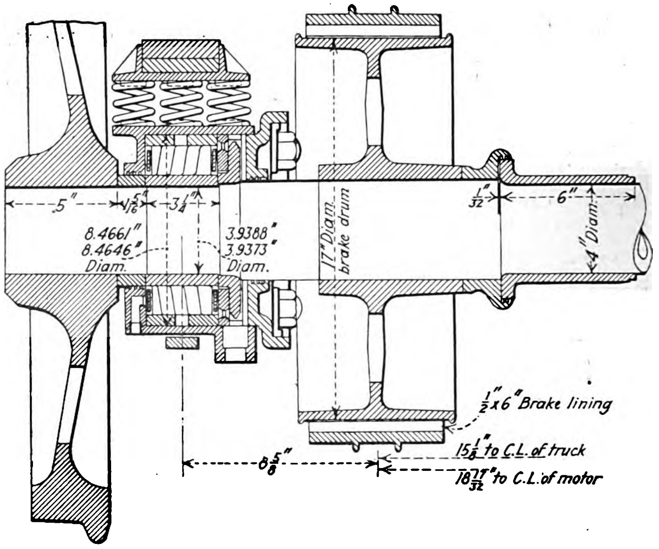
Each of the cars is painted in the university colors of the state or city in which it was built. The Light-Weight Noiseless company's car, which was built in Minnesota, has a body color approximating old gold, and is trimmed in maroon. The St. Louis car is brought out in the St. Louis University colors of blue and white, while the Kuhlman car is finished in the scarlet and gray of Ohio State. On both the Kuhlman and St. Louis cars a striking pennant effect is carried out in the painting scheme.

Bus type bucket seats are installed for the operators. Immediately back of this seat, on each of the three cars, a mahogany framed bulletin board stand extends the full height of the body. A curtain back of this stand serves to protect the operator from the glare of the interior body illumination at night. Near the upper part of the stand a glass-covered frame is arranged so that small blackboard slides can be inserted. These are used to announce baseball scores and other timely news bulletins. Extra blackboards are marked up in advance and are slipped into place quickly by a designated employee when the car reaches some given point on the line. Read-Wil-U-Ryd newspaper vending boxes are fastened to the lower part of the bulletin stands.

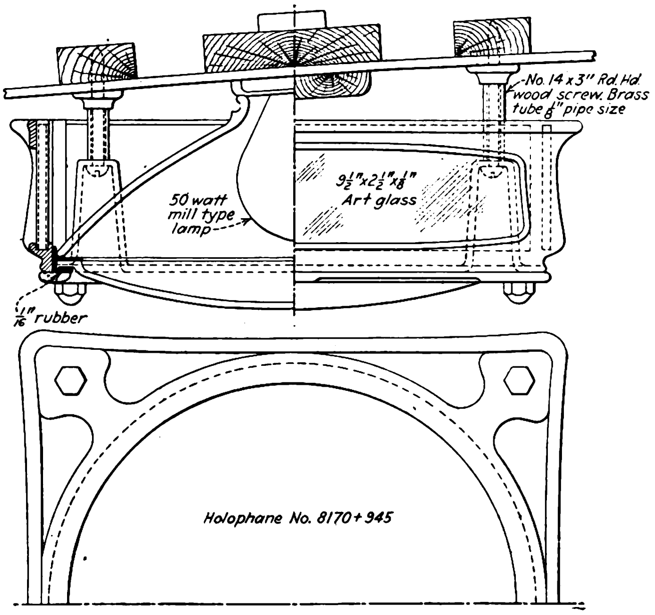
Because of the widespread interest in the various developments incorporated in these sample cars, a complete description of each car will be published in ELECTRIC RAILWAY JOURNAL. They will be described in the order in which they were delivered by the car builders. These include the Light-Weight Noiseless Electric Street Car Company of Chicago, the G. C. Kuhl-


B
B
A
A
Section A-A
Section B-B

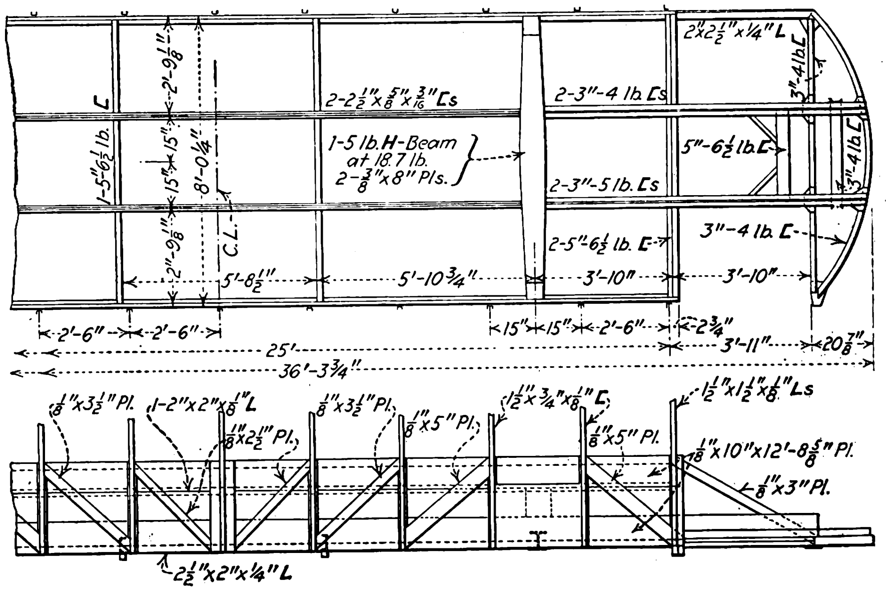
The Steel Framing Is on the Inside of the Side Structure. Outside Panels Are Haskelite. The Channel Side Posts Extend Continuously Across the Car from Side Sill to Side Sill


5"
5/16"
3/4"
8.4661"
8.4646"
Diam.
3.9388"
3.9373"
Diam.
17" Diam. brake drum
1/32"
6"
4" Diam.
1/2"x6" Brake lining
6 5/8"
15 1/8" to C.L. of truck
18 27/32" to C.L. of motor

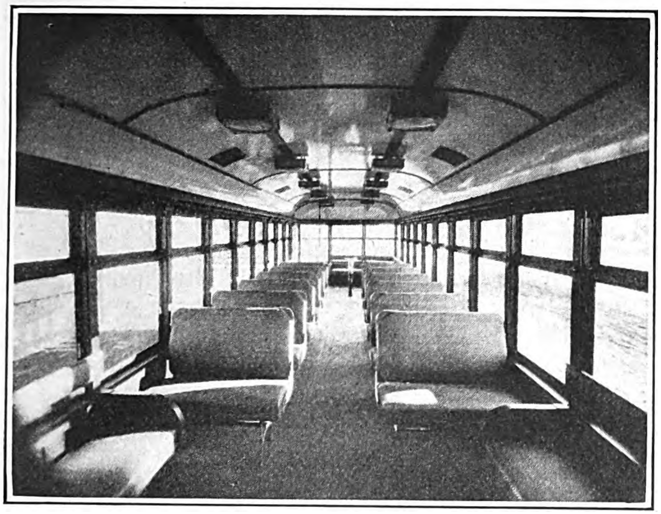
Construction and Position of the Roller Bearing, Inside Journal Box, Are Shown in This Section Drawing


No. 14 x 3" Rd. Hd. wood screw. Brass tube 1/8" pipe size
9 1/2"x2 1/2"x1/8" Art glass
50 watt mill type lamp
1/16" rubber
Holophane No. 8170+945

The Specially Ground Light Reflectors Are Mounted in Square Art Glass Fixtures


2"x2 1/2"x1/4" L
3"-4 lb. L
L
2'-9 1/8"
1'-5"-6 1/2 lb.
15"
15"
8'-0 1/4"
2'-9 1/8"
C.L.
2-2 1/2"x5/8"x3/16" Cs
1-5 lb. H-Beam at 18.7 lb. 2-3/8"x8" Pls.
2-3"-4 lb. Cs
2-3"-5 lb. Cs
5"-6 1/2 lb. C
3"-4 lb. L
2-5"-6 1/2 lb. C
3"-4 lb. C
5'-8 1/2"
5'-10 3/4"
3'-10"
3'-10"
2'-6"
2'-6"
15"
15"
2'-6"
2 3/4"
3'-11"
20 7/8"
25'
36'-3 3/4"
1/8"x3 1/2" Pl.
1-2"x2"x1/8" L
1/8"x2 1/2" Pl.
1/8"x3 1/2" Pl.
1/8"x5" Pl.
1/2"x3/4"x1/8" C
1/8"x5" Pl.
1/2"x1/2"x1/8" Ls
1/8"x10"x12'-8 5/8" Pl.
1/8"x3" Pl.
2 1/2"x2"x1/4" L

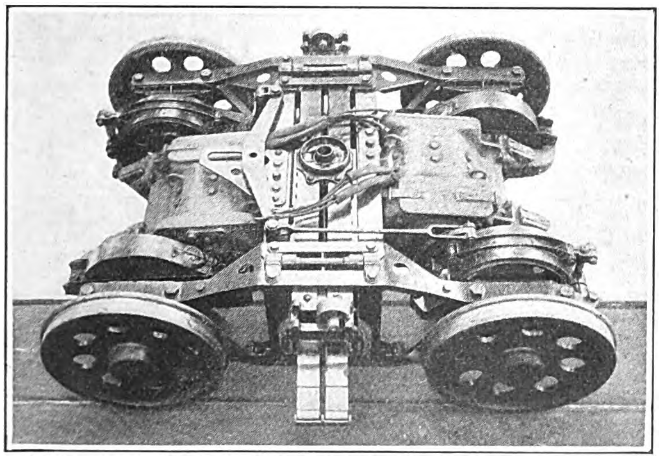
Two Longitudinal Floor Sills, Each Composed of 3-In., 5-Lb. Channels Back to Back, Are Carried the Entire Length of the Car. Diagonal Braces Reinforce and Stiffen the Side Frame Construction



Haskelite Is Used for the Headlining, and Formed Cornell Board Finishes the Ends of the Body Under the Hoods. Seats Are Upholstered in Rattan, Stained Green. Note the Appearance of the Special Lighting Fixtures

man plant of the J. G. Brill Company in Cleveland, and the St. Louis Car Company of St. Louis, Mo.

The sample car submitted by the Light-Weight Noiseless Electric Street Car Company was built in the Snelling Avenue shop of the Twin City Rapid Transit Company. This car is 37 ft. 6 in. long over all, 8 ft. 6 in. maximum over all outside width and 10 ft. 5¼ in. high from rail over trolley board. It weighs 25,000 lb. and seats 45 passengers.



Carefully Machined Parts Feature the Truck Construction

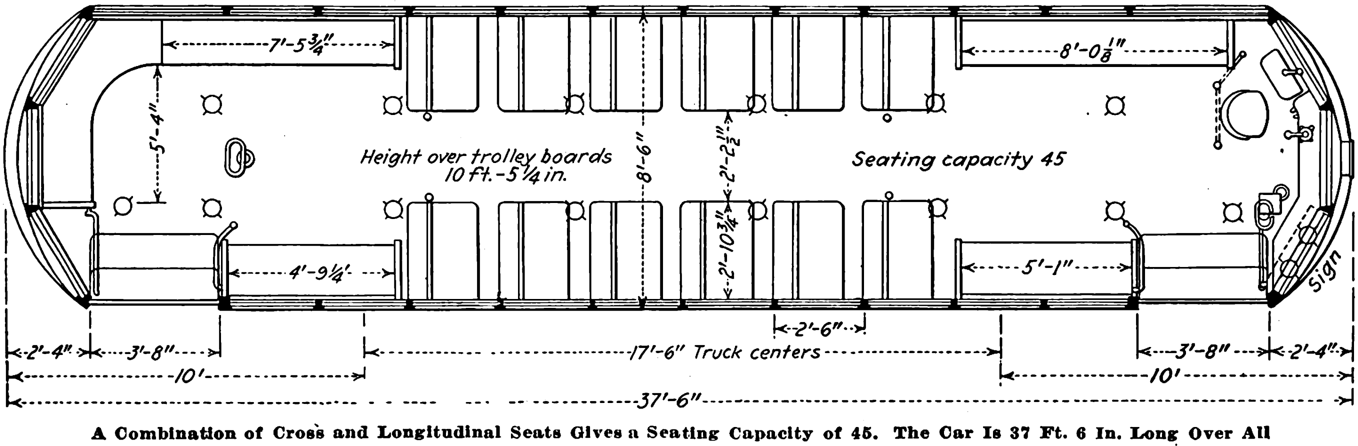
Inside journal boxes are equipped with Hyatt roller bearings. The fabric-lined clasp shoe brakes are supported on an extension bolted to the inside face of the journal box. The axles have a 2¼-in. hole bored through their entire length.

Folding front and rear doors are operated with National Pneumatic engines and are equipped with safety interlocking door control. Valves are provided to permit operation either by the one-man, two-man method or by one man and street fare collectors. To this end a Westinghouse selector valve is attached to the M-28 brake valve so that when the car is handled by one man the operator may control both front and rear doors from his position at the front end. A conductor's valve mounted on a stand at the rear end gives him control of the rear doors for two-man operation, and a valve on the outside permits a fare collector on the street to open the rear doors. Under normal one-man operation, both entrance and exit may be at the front and alighting passengers may also be allowed to leave at the rear. For this type of service the operator's selector valve gives him control of the rear door. When two men are on the car, entrance may be either at the rear or front and depending on whether the car is operated "pay enter" or "pay leave." If street fare collectors are available, passengers may be permitted to board at both the front and rear ends at congested points, subsequently leaving the car at the front end, as it continues under one-man operation.

These folding doors inclose inside step wells, built in a unit with the door frame. A continuous level floor extends throughout the length of the body. There are twelve stationary cross seats. Longitudinal seats are installed near the ends of the body to increase the standing area at these points. The seat opposite the rear door extends around the back end in circular form and increases the total seating capacity to 45 passengers. All seats are upholstered in rattan, which is stained a light green to improve the interior appearance.

The vestibule belt rail is in line with that of the body, thus making the vestibule rail very low and giving the motorman a clear view of the track while seated. The K-35 controller is dropped down in the vestibule floor, to put the handle at a convenient height. The air-brake valve and door-control valve, together with light, compressor and other switches, are mounted in a cabinet which incloses the piping and apparatus at the front end of the car and finishes the interior of the vestibule. This arrangement provides a form of instrument board and places the control apparatus in a convenient position for the seated operator.

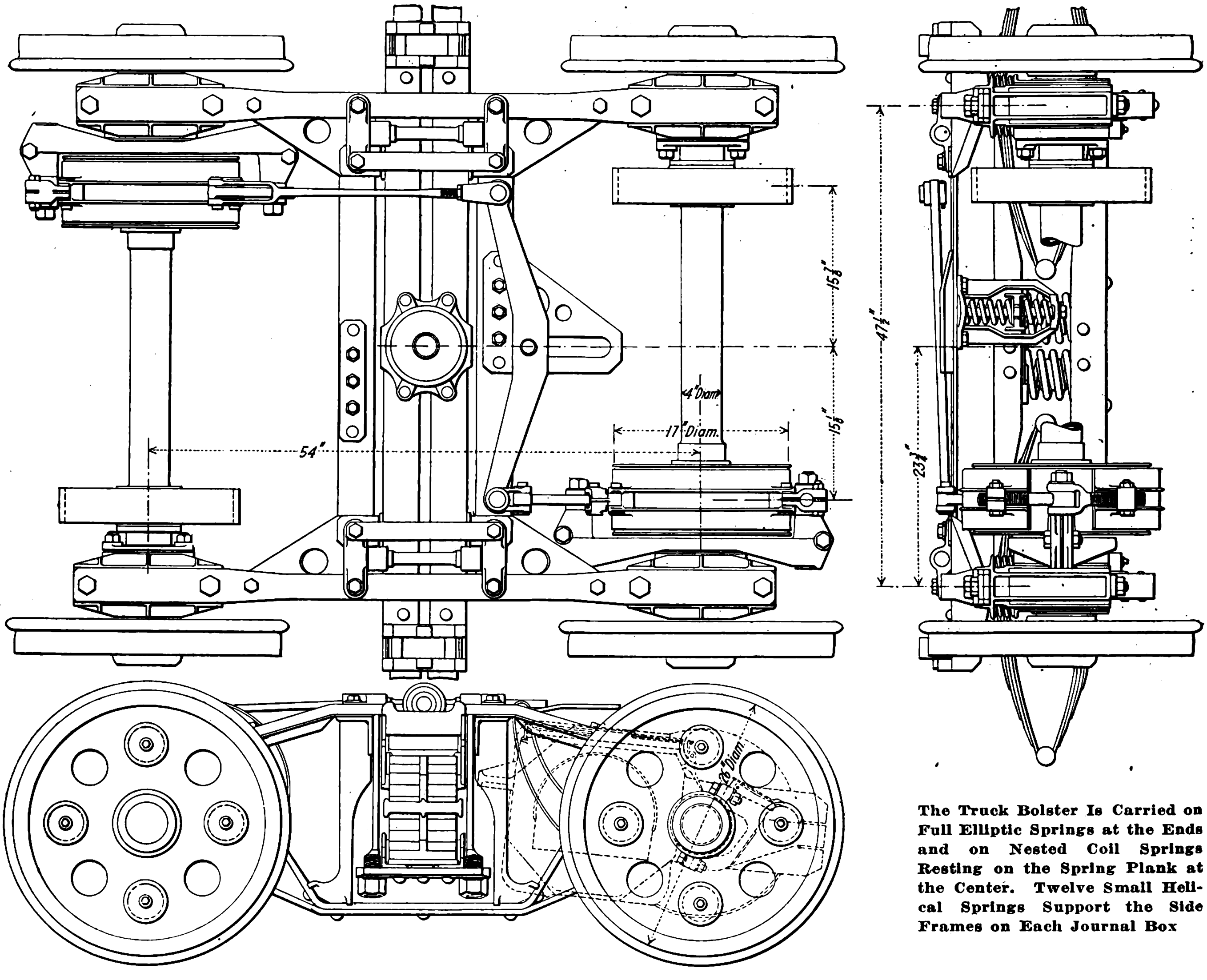
Accompanying drawings show the construction of the side framing and a general outline of the steel framing assembly. The side posts are formed of 1½-in. by ¾-in. by ⅛-in. channels set on 30-in. centers with the channel



A Combination of Cross and Longitudinal Seats Gives a Seating Capacity of 45. The Car Is 37 Ft. 6 In. Long Over All and Is Arranged for Single-End Operation

webs turned out. These extend continuously from side sill to side sill to form both the posts and roof supports; 2½-in. by 2-in. by ¼-in. angles are riveted across the backs of the side post channels along the bottom. Light-weight longitudinal channels, exposed on the interior of the car, are riveted to the side posts at the belt rail line. Between the posts and these channels, and also between the posts and the side sill angles, ⅛-in. by 10-in. steel plates are interposed. These extend longitudinally the length of the body. Steel braces ⅛ in. thick and of widths varying from 2½ in. to 5 in. are riveted diagonally between the side posts. The post channels and side sill angles are filled on the outside with oak furring strips to support ⅜-in. Haskelite side panels that finish the exterior.

The upper sash is continuous and is constructed so that the upper rail forms the letterboard. This construction is clearly shown in the cross-section. Body bolsters are made of 5-in. 18.7-lb. heat-treated H-beams with ⅜-in. by 8-in. reinforcing plates top and bottom. The roof is of 5/16-in. Haskelite and the same material, 3/16 in. thick, is used for the headlining in the body. The vestibule hoods are finished on the interior with 3/16-in. Cornell board, formed to a smooth, curved shape. The body floor is double, consisting of a ⅝-in. thick lower cypress floor laid crosswise with 1⅛-in. oak running longitudinally above it. These are separated by 3/16-in. Flaxolinum insulating material. At the front end of the car a bumper is built of oak reinforced with a steel plate and faced with a rubber buffer block.



The Truck Bolster Is Carried on Full Elliptic Springs at the Ends and on Nested Coil Springs Resting on the Spring Plank at the Center. Twelve Small Helical Springs Support the Side Frames on Each Journal Box

The trucks are similar in design to the type developed after a number of years of experience in Minneapolis and described in the Sept. 29, 1923, issue of ELECTRIC RAILWAY JOURNAL, page 518. Two full-elliptic springs rest on a spring plank carried from the truck transom on swing links. These springs in turn carry the bolster, which is further supported on nested helical springs mounted at the center of the spring plank. Journal boxes with Hyatt roller bearings are mounted inside the wheels. The truck side frame rests on a group of twelve small helical springs above each journal box. Axles are 4-in. diameter with a 2¼-in. hole bored throughout their length. Each of the 26-in. diameter rolled steel wheels has eight 3-in. diameter holes drilled in the web to reduce weight and to help deaden the ringing sound of the wheels. Rubber washers of approximately 4 in. diameter and ½ in. thickness are bolted to the wheel web at four of these holes. Brake drums having a diameter of 17 in. are pressed on the axles and act in place of motor thrust collars. An adjustable toggle clasp brake surrounds this drum, the shoes being fitted with ½-in. by 6-in. brake lining. The brake mechanism is carried directly on a casting forming part of the journal box at this end of the axle, so that the shoe and drum are held in accurate alignment. This construction is shown in an accom-

DETAILS OF THE LIGHT-WEIGHT NOISELESS CAR ON TRIAL IN GRAND RAPIDS

Type of car	Single end, one-man, two-man
Length over all	37 ft. 6 in.
Width	8 ft. 6 in.
Height, rail over trolley boards	10 ft. 5¼ in.
Seating capacity	45
Weights:	
Body and equipment	12,705 lb.
Trucks	6,955 lb.
Electrical equipment	4,760 lb.
Air brake equipment	1,080 lb.
Total	25,500 lb.
Armature bearings	S. K. F. roller
Air brakes	General Electric, with CP-25 compressor, fabric-lined clasp shoe brakes on axle mounted drum, full safety devices and selector valve for door control.
Axles	Forged steel, 4-in. hollow
Buzzers	Consolidated
Conduit	Flexiduct for all auxiliary wiring and solar hose for control cables
Conductor's signal bell	Consolidated single stroke
Control	K-35-KK
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic
Energy saving device	Economy meter
Fare box	Woods
Fenders	H. B. Lifeguards
Floor insulation	$\frac{3}{16}$-in. Flaxolinum and tar paper
Gears	G.E. sound deadened
Gong	Electric Service Supplies Company, arranged for manual or pneumatic operation.
Hand brakes	Pittsburgh No. 35 drop handle
Hand straps	Sanitary celluloid (at rear of car only)
Heater equipment	Railway Utility truss-plank type
Headlights	Crouse-Hinds Golden Glow
Headlining	3/16-in. Haskelite in body and 3/16-in. Cornell board under hoods.
Interior trim	Mahogany
Journal bearings	Hyatt roller
Journal boxes	Inside wheels
Lamp reflectors	Special rectangular shape with art glass sides
Motors	Four GE-258
Motorman's seat	John A. Drum Co. D-1 revolving adjustable bus type
Paint	Sherwin-Williams enamel and Chicago varnish
Rear signals	Oskelite
Roof	Haskelite
Sanders	Light-Weight Car Co.
Sash and doors	Mahogany
Seats	Stationary
Seating material	Rattan, stained green
Stanchions	Brass, antique finish
Step treads	Kass
Track scraper	Root pneumatic
Trolley catchers	Ohio Brass
Thermostat	Railway Utility
Trolley base	Ohio Brass
Trucks	Smith No. 12
Ventilators	Railway Utility honeycomb type
Window wipers	Hand operated
Wheels	26-in. Illinois Steel Co. rolled steel
Warning signal	Bosch horn

panying drawing. As a general feature to improve the performance and reduce weight and noise, truck parts are machined to insure accurate and tight fits. The objective has been to approximate automobile workmanship so as to reduce to a minimum any tendency toward rattling or the production of noise due to the assembly of unfinished forged surfaces.

Four 25-hp. General Electric No. 258 motors drive the car. These have S.K.F. roller bearings on the armature shaft at both ends. A specially flexible type of motor suspension on the truck assembly is designed to reduce shocks in starting and stopping the car. These motors have sound-deadening gears, having webs cast with a hollow space which is filled with packed sawdust.

Another feature of the car is the internal illumination. Specially designed fixtures, shown in accompanying illustrations, give a pleasing semi-indirect illumination. The reflectors are ground so that the light rays will be accurately distributed to the reading surface of standing as well as seated passengers.

Each car is equipped with an Economy meter with inspection dial so that a careful study of the performance of the car and its equipment can be made. The principal items of equipment used, together with the general dimensions and distribution of weight, are given in the accompanying tabulation.

Employee Suggestions Aid Safety Work

During 57 Months, 1,288 Suggestions Were Received and 709 Approved—General Manager's Office Is Responsible for Execution of All Ideas Accepted

ON THE Key System Transit Company, Oakland, Cal., the safety organization has been expanded to take care of suggestions for improvements of every sort. Each department is supplied with a wooden box similar to the ordinary mail box. An employee desiring to make a suggestion or recommendation calls on the foreman and secures a printed form, fills it out, and deposits it in the box. Once a month the box is emptied by the district safety committee, composed of men working in the department where the suggestion originates. These committees meet the first week in each month and act on the suggestions. Approval or disapproval is noted in a space provided for such purpose on the printed form.

The suggestions are then forwarded to the advisory committee, composed of heads of departments, which meets the second week in each month. Its members act on the suggestions, fill in the printed forms with notations concerning their action, and then forward the suggestions to the final authority—the executive committee. This consists of officers of the company and meets in the third week of each month.

Each committee has its regular meeting day and all members know just when the meetings will be held. Nevertheless, written notices of meetings are sent out a week in advance. Besides, members are reminded again by telephone about two hours before the meeting. This brings out a full committee. If a member is absent because of sickness or for some other good cause he is excused, but if he cannot give a good excuse he is listed on the minutes as "absent without excuse."

Action of the executive committee is final, regardless of the action taken by other committees. At times it disapproves suggestions approved by other committees or approves suggestions disapproved by other committees. After this meeting, the work of the secretary commences. Typed minutes are mailed out to every member of the executive and advisory committees. Action taken by the executive committee is noted on the suggestion form and the suggestions are then indexed, so that any one can find any suggestion in any one of five ways, by name of proponent, by location concerned, by department making the suggestion, by number or by date as acted upon by the executive committee. All suggestions are then referred to the general manager's office for execution. All proponents of suggestions disapproved are given a detailed written explanation of the reason for disapproval.

The organization is made up of 134 men divided into eighteen committees. Six committees, one from each carhouse in the mechanical department, report to the mechanical department committee. The latter and one each from the marine department, store department, roadway department, electrical department and each division of the transportation department report direct to the advisory committee. These committees are composed of employees, with their foremen acting as chairmen. The advisory committee is composed of the chairmen of all sub-committees, and it reports direct to the executive committee, consisting of officers of the company. Meetings are held during regular working hours and are so arranged that they follow each other without holding up the suggestions, and all details and papers finally reach the secretary about two days previous to the meeting.

An annual report is made, listing every individual suggestion, telling its story and action taken, giving the name of the proponent and showing graphic charts. They are sent to the chairmen, vice-chairmen and secretaries of all committees.

The safety first organization operates without a budget. All work costing less than $50 is authorized by the general manager's office. In other cases the personal authority of the general manager is secured. For amounts greater than $200 the authority of the board of directors is secured, but such cases are rare.

This plan was inaugurated on April 1, 1920. Up to Dec. 31, 1924, 1,288 suggestions had been received and acted upon. Of that number, 709 were approved. The cost in 57 months of operation totaled $32,239 or $565 per month. The largest amount of money expended in any one year was $11,499 in 1921, and the smallest amount of money spent in any one year was $1,910.27 in 1924. This is actual cost of all work done, but does not include the time of men attending meetings. Employees' liability cost the railway only 0.2 of 1 per cent of the gross operating revenue for the year 1924. This low figure is thought to be attributable to the effective safety work done.

Light-Weight Cars Make Big Saving

Power, Equipment and Track Maintenance Costs Have Been Reduced on the Milford & Uxbridge Street Railway by the Operation of Modern Rolling Stock

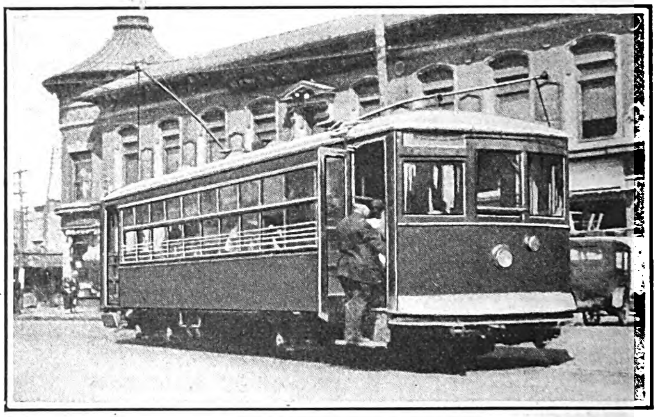
OPERATION of six new light-weight cars during the past eighteen months on the Milford & Uxbridge Street Railway, Milford, Mass., has shown substantial savings in a number of ways. These cars, built by the Wason Manufacturing Company, Springfield, Mass., were brought to Milford under their own power. The weight is 32,000 lb. and the seating capacity is 44. They replace old double-truck cars weighing from 45,000 lb. to 50,000 lb. each.

The main line of the railway runs from South Framingham to Uxbridge. An hourly headway is operated during the day with half-hourly service in the rush hour. A large part of the traffic consists of people bound from Milford and surrounding towns to Boston, or those returning. Connection is made with the Boston & Albany Railroad at South Framingham. Special attention is paid to making convenient connection with trains of the latter road.

Prior to the purchase of the new rolling stock this service was given by the heavy double-deck cars already mentioned. Now, however, the light-weight cars are operated all day, and the older type are used mostly in tripper service on the main line and to the manufacturing town of Hopedale, a community located a short distance south of Milford. The railway carries about 1,400 people daily to and from Hopedale. Old 26-ft. single-truck cars which at one time were used in this service have been retired and burned.

Most easily calculated is the saving in energy. With the new cars energy consumption is slightly less than 1.5 kw.-hr. per car-mile as against an average of over 3 kw.-hr. per car-mile with the older rolling stock. Schedule speed is 15 m.p.h. with an average of three stops per mile. Each of the new cars is equipped with four Westinghouse 508-A motors. A daily average of about 200 miles is operated. The management estimates the operating costs to be in the neighborhood of 25 cents per car-mile. Accurate determination of this figure is impossible, however, because the older and heavier cars are also operated.

Equipment maintenance costs have been reduced. This is partly because the equipment is new, and also in part because the design is more suitable to the service required of it than that formerly used. No saving, however, has been made in the matter of wheels. These are of 28-in. diameter with steel tires. This railway has no wheel press and for that reason has followed the practice of using steel-tired wheels. The average life of a tire is from 18 to 24 months, or approximately 140,000 miles. Thus far three pairs of wheels have been changed under the new cars. It is the practice to allow them to be worn down once and then turned in a lathe. After they have been worn down a second time they are scrapped.



Cars of This Type Have Reduced Operating Expenses on the Milford & Uxbridge Street Railway

An olive-green color, known as light Pullman, is used for exterior painting. Striping and lettering is gilt. This light Pullman color is favored by the management because of the ease of patching. A scratch or dent can be touched up and after a short time the new paint so blends with the old that the patching is practically invisible.

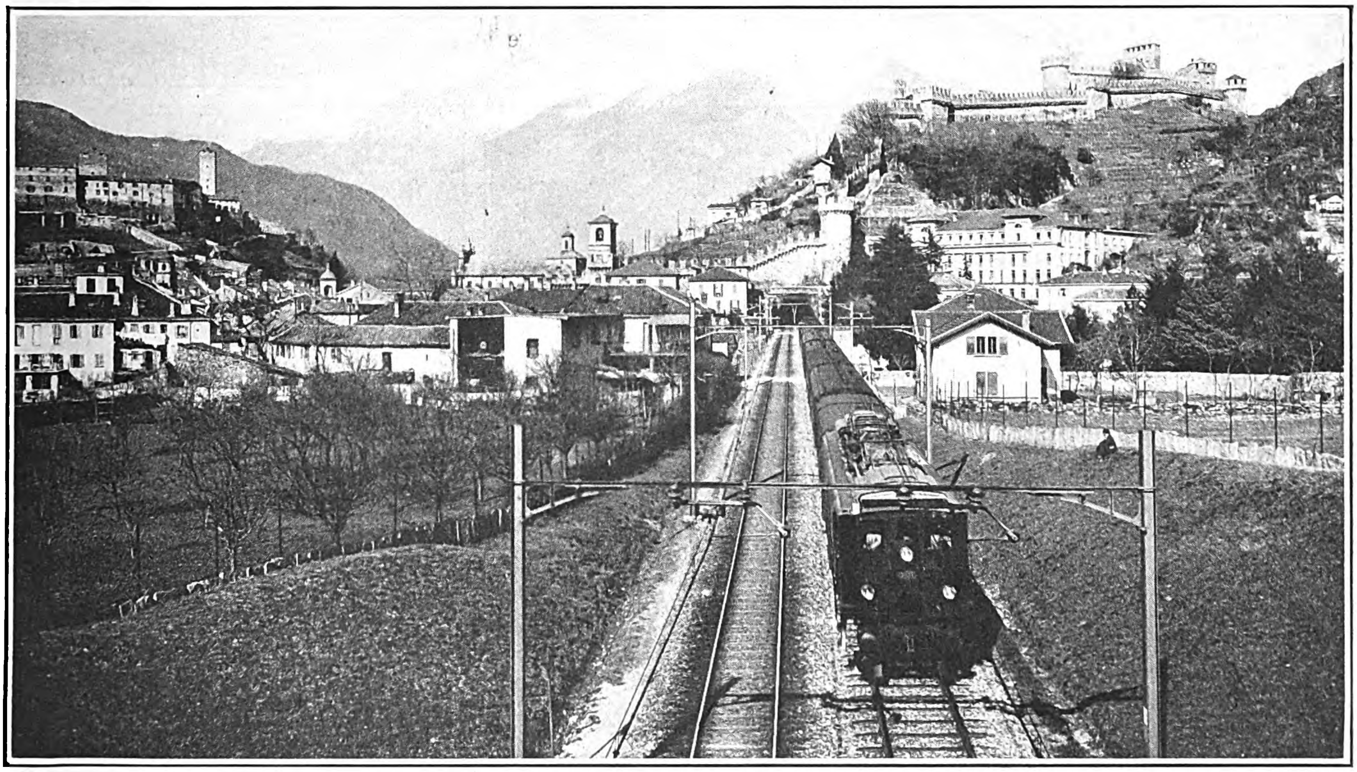
Track of the Milford & Uxbridge Street Railway is well maintained but has not been rebuilt since it was laid in 1903. The first rail used on the main line was the old 48-lb. horse car section, laid in 1898. This was replaced in 1903 by 70-lb. T-rail, which is still in service. The good riding qualities of the new cars over this old track is attributed by the management to the use of Brill 77-E trucks. It is impossible at present to determine exactly what saving in track maintenance cost will result from the use of cars of lighter weight.

The total population served by the railway is only about 35,000. New cars have been an important factor in permitting the company to continue operation in this sparsely settled territory. On Dec. 28, 1924, the fare was increased. The present rate is 13 cents cash for one zone, while the two-zone fare is 25 cents, the three-zone fare is 35 cents, and tickets are nine for $1. Between Milford and South Framingham the electric railway fare is the same as that on the Boston & Albany Railroad.

The only drawback to the new rolling stock is the difficulty of starting on an icy rail. It is said that the small wheels under light-weight cars have a tendency to spin instead of gripping the rail. During winter storms, therefore, the new cars are used in service to Hopedale and heavy cars are used on the main line.

Electrification of Swiss Federal Railways Progressing Rapidly

By the End of 1928 it Is Planned to Complete 973 Miles, Comprising Nearly All the Main Lines—Ultimately the Entire System of 1,802 Miles Will Be Electrified—Single-Phase Alternating Current at 15,000 Volts Will Be Used for All Except One Short Section



Bellinzona, in the Mountains of Southern Switzerland, on the Electrified Section of the St. Gothard Route

IN NO other country has the development of railroad electrification progressed as rapidly in recent years as in Switzerland. Shortly before the World War it was decided to electrify the entire railroad system of the country. The motives behind this scheme were threefold; to reduce operating costs, to render the railroads independent of a foreign coal supply, and to aid the unemployment situation. Construction work, however, was considerably delayed by the war.

Originally it was planned to complete the electrification of 624 miles by the end of 1928, and to continue for some 30 years at the rate of about 60 miles a year until the entire system of 1,802 miles was electrified. In the early part of 1923, however, the program of 1918 was changed to hasten the progress of the work, as told in ELECTRIC RAILWAY JOURNAL of April 7 that year. Under the new plan it is expected that 973 miles, comprising nearly all the main lines, will be electrified within the next three years. The total cost of the undertaking is estimated at about 760,000,000 Swiss francs.* Of this sum 700,000,000 francs will be supplied by the Swiss Federal Railways, and 60,000,000 francs will be contributed by the government. Although in Switzerland the railway is a state enterprise, it keeps separate accounts.

Distribution of expenditures is expected to be about as follows:

	Per Cent
Hydro-electric power plants	21.5
Transmission lines	8.0
Substations	8.5
Catenary construction	18.0
Rolling stock	30.0
Miscellaneous	14.0
	100.0

Two principal railway routes cross Switzerland, both taking their names from important tunnels through which they pass. The Simplon route is the main line from Paris to the Near East, and passes through Geneva, Lausanne, Sion, and the Simplon Tunnel into Italy. Between Sion and Iselle in Italy 47 miles of this line have been operated by electricity for several years. Three-phase current at 3,300 volts 16⅔ cycles is used. Electrification as far as Geneva is at present in progress.

Running north and south is the St. Gothard route, which goes down from Basel, Lucerne and Zurich into Italy, passing through the St. Gothard tunnel. Electrification of practically all of this line, referred to in ELECTRIC RAILWAY JOURNAL for Sept. 20, 1924, has now been completed. On this route and on the new sections of the Simplon route single-phase current at 15,000

---

*At present a Swiss franc is worth 18.34 cents.

volts 16⅔ cycles is used. This has been adopted as standard for the entire system and it is planned to change over the line between Sion and Brigue, leaving only the 13.6-mile section of the Simplon Tunnel operated with three-phase current.

Power is produced in the generating stations of Ritom-Amsteg and Barberine-Vernayaz. One plant of each group works chiefly during summer and one during the winter. These complementary units are connected by 60,000-volt transmission lines. The first pair supply power for the St. Gothard line while the second pair serve the Simplon route and other lines in western Switzerland.

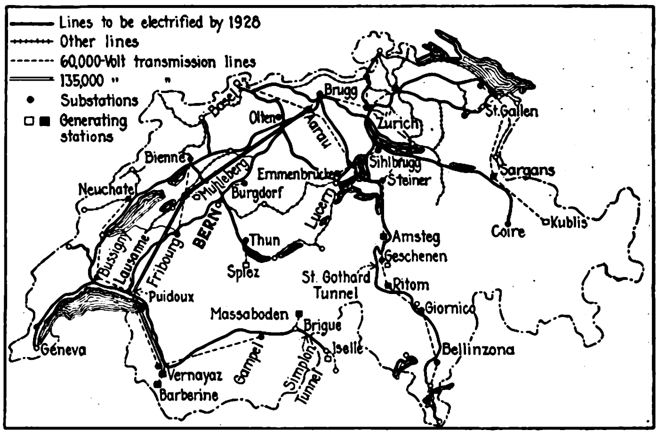
The power station at Amsteg is near the northern entrance of the St. Gothard Tunnel, and a second at Piotta is some 5 miles beyond the southern entrance. At Amsteg advantage is taken of the fall of the river Reuss from the Pfaffensprung, about 900 ft. above the power station. The gorge through which the river runs has been closed by a curved dam to form a reservoir, and a tunnel conveys the water to the pipe line which extends to the generating station. Amsteg is in use mainly during the summer, while Piotta station, which utilizes the water of Lake Ritom and the Fossbach Fall, is used chiefly in winter. During the summer water is allowed to accumulate in the lake, which is about 2,950 ft. above the power house. The capacity of the lake as a reservoir has been increased by the construction of a dam across one corner, as shown in an accompanying illustration.

To furnish power for the electrified Simplon line and the government railway system in the west, two large generating stations utilizing the water of Lake Barberine have been built. These are known as the Barberine and Vernayaz plants, and will be operated in a manner similar to the Amsteg-Ritom group. The Vernayaz-Barberine combination, however, is more fortunately placed than the other combination because the water of the Barberine lake is utilized in the two generating stations one after the other. It is estimated that the Barberine-Vernayaz group will be able to generate at a cost of 3.35 centimes per kilowatt-hour.

These two groups of hydro-electric generating stations of Swiss Federal Railways will be able to produce about 420,000,000 kw.-hr. per year. Except in especially dry years the Ritom station should be able to supply 40,000,000 kw.-hr. Amsteg station has been designed for an annual output of 150,000,000 kw.-hr., of which at least 55,000,000 kw.-hr. can be supplied during the winter. The two stations together, therefore, have a capacity of 190,000,000 kw.-hr. Barberine generating station is capable of supplying about 60,000,000 kw.-hr., of which 80 per cent will ordinarily be supplied in winter. At least 170,000,000 kw.-hr. will be produced at Vernayaz, of which 105,000,000 kw.-hr. will be generated from May to October.

Between Brigue and Iselle, the section which is to remain permanently three-phase will be supplied with power by the small Massaboden power station of the Swiss Federal Railways and by the Dynamo Company of Milan. In the easterly part of Switzerland the railway will continue to be supplied with power from the generating station at Kublis, utilizing the Grisons water power. In the vicinity of Bern the Spiez generating station will continue to supply power to the Bern-Scherzligen section.

Later the single-phase current of the Federal Railways is to be connected with the three-phase system of the Bernese water-power generating station by means of rotary converters installed in the Muhleberg station. It is proposed that the converter group here shall work both ways for transforming three-phase power purchased by the railway into single-phase current, or for transforming excess single-phase current into three-phase for commercial use. In order to insure the efficient use of its hydro-electric generating station when the traffic on the railway is not sufficiently great to require the entire amount of energy available, a three-phase generator of 9,000-kw. capacity has been installed at Amsteg. A similar installation is planned for Vernayaz. These will permit the railway to dispose of excess power to private enterprises.



Plans for the Electrification of the Swiss Federal Railways Call for the Completion of 973 Miles by the End of 1928 and Ultimately the Electrification of the Entire System

Transmission lines connecting the generating stations to the substations are carried on iron towers alongside the railway line. In general the 60,000-volt lines use copper conductors, while for the 135,000-volt line from Vernayaz to Rupperswil it is planned to use aluminum steel conductors. Ritom and Amsteg stations are connected by underground transmission cables working at 30,000 volts. Cables are carried through the numerous tunnels of the St. Gothard line and operate in an entirely satisfactory manner.

SPECIFICATIONS OF SINGLE-PHASE LOCOMOTIVES

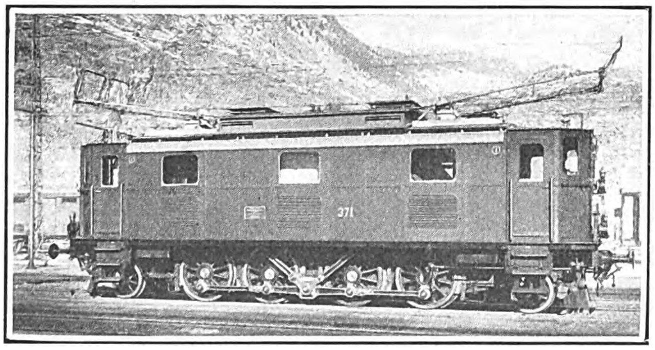
Series numbers	10201-27	10301-46	10401-50	12303-12	12313-42	12501-06	14251-83	16301-02
Number of vehicles	27	46	50	10	30	6	33	2
Number of motors	3 twin	3	2	4	4	4 twin	4	1
Number of driving axles	3	3	3	4	4	4	6	3
Number of carrying axles	2	3	3	2	2	3	2	1
Nature of drive	Individual gear	Individual gear	Gear and rod	Gear and rod	Gear and rod	Individual gear	Gear and rod	Gear and rod
Gear ratio	1-5	1-2.57	1-2.224	1-3.5	1-3.195	1-5.7	1-4.03	1-3.75
Total weight, metric-tons	81.1	92.3	98.5	106.5	111.4	110.5	128.0	48.8
Length over buffers	40 ft. 2⅝ in.	48 ft. 3 in.	46 ft. 2¾ in.	54 ft. 2 in.	54 ft. 2in.	53 ft. 3⅛ in.	63 ft. 8 in.	32 ft. 2⅝ in
Wheelbase	30 ft. 6 in.	35 ft. 1¼ in.	35 ft. 1½ in.	44 ft. 3⅜ in.	44 ft. 3⅜ in.	44 ft. 9 in.	54 ft. 2 in.	19 ft.3⅜ in.
Diameter of driving wheels	5 ft. 3⅝ in.	5 ft. 3⅝ in.	5 ft. 3⅝ in.	5 ft. ¼ in.	5 ft. ¼ in.	5 ft. 3⅝ in.	4 ft. 5⅛ in.	3 ft. 5 in.
Voltage of motors	660	505	380	505	505	660	400	505
Tractive effort, pounds	16,980	18,400	18,300	20,170	23,370	25,350	37,030	12,680
Maximum speed, m.p.h	56	56	56	46.6	46.6	46.6	40.4	24.9

There are in all 25 substations, located as shown on the accompanying map. Transformers are of two types, 3,000-kw. and 5,000-kw. capacity, having half-hour overload capacities of 4,500 kva. or 7,500 kva. respectively. All cables leaving the substations are controlled by hand-operated line switches connected in groups to busbars and fed through automatic cutouts. Feeder cutouts are shunted by a resistance which enables the insulation of the lines to be checked after cutting out. Inclosed substations have been installed on the St. Gothard line, but more recently the open-air type has been built. Energy consumption of the railways in 1923 was 62.6 watt-hours per ton-mile measured on the 15,000-volt bus in the power house and 56.4 watt-hours per ton-mile measured at the substation bus.

Simple catenary suspension is used for the trolley wire at a height varying from 18 ft. to 21 ft. 8 in. above the rail. A single copper contact wire of 0.166 sq.in. cross-section is used with a steel messenger wire of 0.077 sq.in. cross-section. In tunnels the same contact wire is used, but the messenger is a combination of steel and copper with 0.087 sq.in. cross-sectional area. On sidings the contact wire is of smaller section but the messenger wire is the same. Supports are simple iron bridges or posts with bracket arms. Spacing of supports for the overhead structure varies from 200 to 325 ft.

Approximately 200 single-phase electric locomotives are in operation or on order. This is in the proportion of 90 electrics for every 100 steam locomotives formerly operated. Oil-cooled transformers are used. These are fitted with supplementary collectors capable of supplying 450 kw. at 800 to 1,000 volts for electric heating of trains. Through trains containing foreign rolling stock are heated by steam furnished by special heating cars coupled on to the trains.

Principal details of the locomotives are shown in the accompanying table. Those designed for operation on the St. Gothard route, where the grades are heavy and long, are equipped with electric brakes, some of the regenerative type and some resistance type. A small number of multiple-unit cars have also been built. Expenditures for rolling stock up to the end of 1928 are expected to amount to approximately 210,000,000 francs or 30 per cent of the cost of electrification.

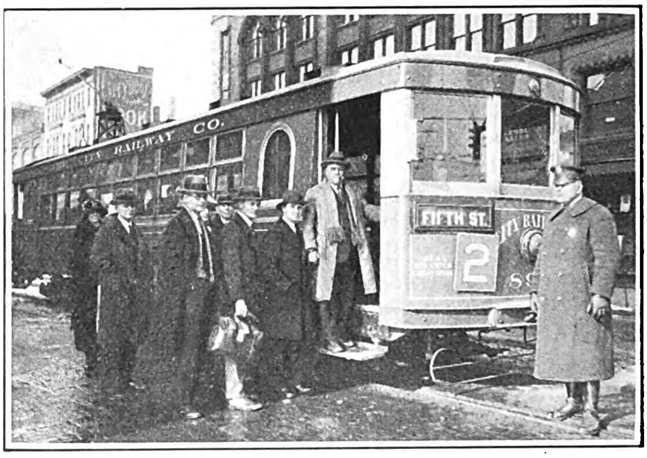


Type of Three-Phase Electric Locomotive Used on the International Section Between Brigue and Iselle, Including the Simplon Tunnel

Electric operation of the Swiss Federal Railways has so far given entire satisfaction. Figures for operations to date cannot be regarded as final because the work of construction is still in progress. Not the least of the advantages of electrification, however, is the public good will which has resulted therefrom.

Monel Metal Side Sheets Stand Up in Dayton

SIDE sheets and dash made of monel metal have been entirely successful after two years of service on the experimental car built for the City Railway of Dayton, Ohio, by the Cincinnati Car Company. No paint or varnish is used on the metal. The striping and lettering shown in the accompanying illustration are aluminum, and set off well from the natural color of the metal. The monel metal, which is a natural commercial alloy of copper and nickel, assumes a pleasing blue-gray color which gives the car a very attractive appearance.



After More Than Two Years of Service, This Sample Car of the City Railway in Dayton Shows the Appearance of the Monel Metal Used for the Exterior to Eliminate the Need for Paint

The saving in cost of paint is, of course, a decided advantage. It is estimated that this saving has already more than paid the total additional cost of the monel over ordinary sheet steel. The practice has been simply to wash the car periodically, as would be done in the case of paint. When the metal surface is wiped off after this treatment it assumes its natural bluish color, with no evidence of tarnish or streaking.

On the sample car the letterboard and the vestibule posts are painted. These, together with the sash frames, are the only parts on the exterior which have required any additional attention except washing.

Progress in Safety Matters

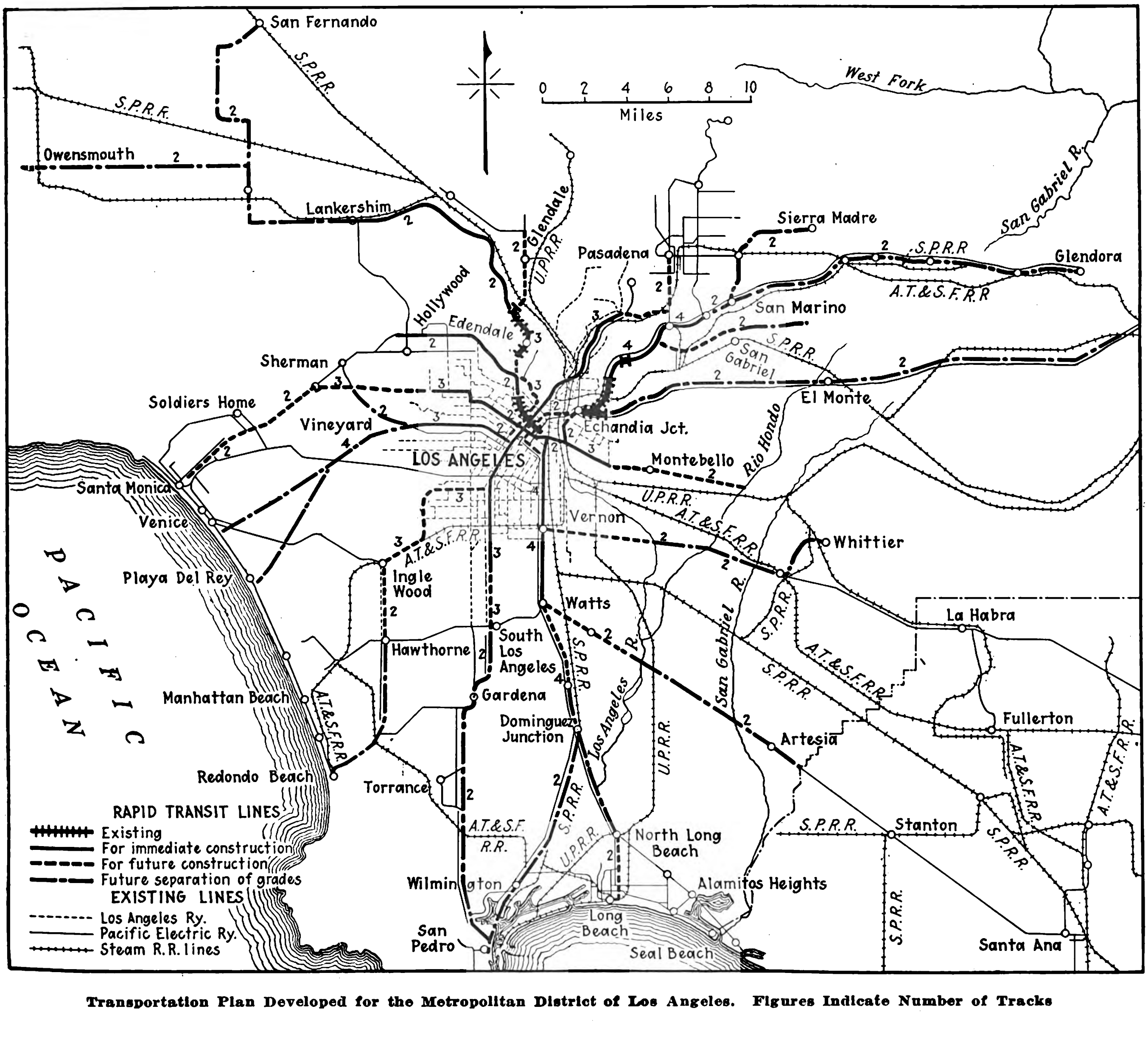
SEVERAL articles relating to safety methods on electric railways appear in the May issue of the *National Safety News*. One of these is a contributed article by A. W. Koehler, director of safety New York State Railways, Rochester, N. Y., descriptive of the precautions adopted on the two long interurban divisions of the New York State Railways, Rochester lines, to protect grade crossings. Another article treats of safety methods of the United Railways & Electric Company of Baltimore, including the organization of the safety committee, and selection and training of men for the transportation department. A car of the West Penn Railways, described in a third article, has been equipped with safety features standard on the line, for the purpose of teaching the public the means adopted by the company to reduce accidents. There is also an account of the receipt of the Rice safety award for 1924 by the Beaver Valley Traction Company of New Brighton, Pa.

Comprehensive Transportation Plan for Los Angeles

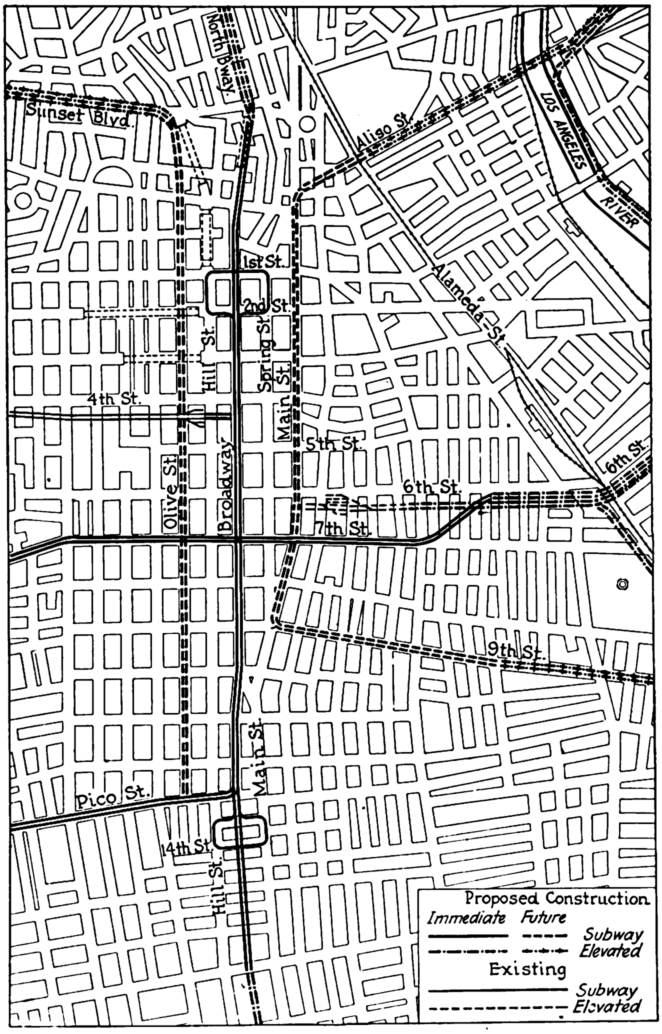
Report to City Council by Kelker, De Leuw & Company Recommends Rapid Transit Construction and Co-ordinated Operation of All Transportation Facilities Under One Management — Special Assessment Against Benefited Property Advocated for Financing Construction Cost

DEVELOPMENT of a comprehensive unified transportation system consisting of a combination of rapid transit, interurban street railway and motor bus lines is the subject of a plan that has been presented to the Council of the city of Los Angeles and the Board of Supervisors of Los Angeles County by Kelker, De Leuw & Company of Chicago. This report, in the main, proposes a consolidation of all local transportation facilities in Los Angeles under a single operating management and outlines a general local transportation system designed ultimately to meet the requirements of a city of 3,000,000 population. To give adequate transportation under existing conditions, rapid transit construction, together with improvements of interurban lines and extensions of street railway and motor bus facilities, is recommended for an immediate program. Co-ordination of all these facilities under one management is advocated as a necessary step. These lines are intended to form the nucleus of a more comprehensive system recommended for future requirements.

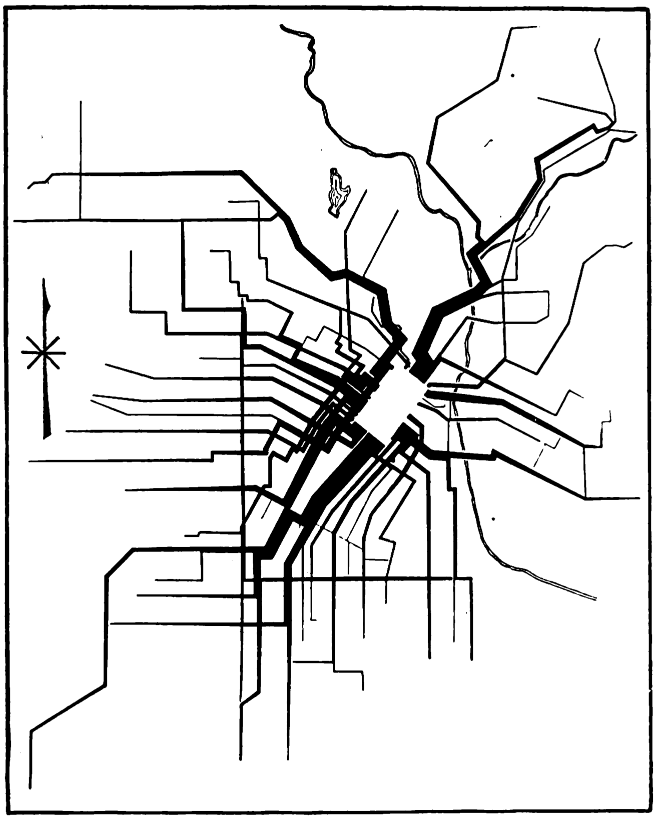
A low rate of fare is recommended. Special assessment against the benefited property is proposed as an equitable method for financing rapid transit construc-


San Fernando
S.P.R.R.
S.P.R.R.
Owensmouth
Lankershim
Glendale
U.P.R.R.
Hollywood
Edendale
Pasadena
Sierra Madre
S.P.R.R.
Glendora
San Gabriel R.
West Fork
A.T.&S.F.R.R.
San Marino
San Gabriel
S.P.R.R.
El Monte
Sherman
Soldiers Home
Vineyard
Echandia Jct.
LOS ANGELES
Montebello
Rio Hondo
U.P.R.R.
A.T.&S.F.R.R.
Santa Monica
Venice
Vernon
Whittier
Playa Del Rey
A.T.&S.F.R.R.
Ingle Wood
Watts
La Habra
PACIFIC OCEAN
Hawthorne
South Los Angeles
S.P.R.R.
Los Angeles R.
San Gabriel R.
S.P.R.R.
A.T.&S.F.R.R.
S.P.R.R.
Manhattan Beach
A.T.&S.F.R.R.
Gardena
Dominguez Junction
U.P.R.R.
Fullerton
Artesia
Redondo Beach
Torrance
A.T.&S.F.R.R.
A.T.&S.F.R.R.
A.T.&S.F. R.R.
S.P.R.R.
U.P.R.R.
North Long Beach
S.P.R.R.
Stanton
S.P.R.R.
Wilmington
Alamitos Heights
S.P.R.R.
San Pedro
Long Beach
Seal Beach
Santa Ana
0 2 4 6 8 10
Miles
RAPID TRANSIT LINES
Existing
For immediate construction
For future construction
Future separation of grades
EXISTING LINES
Los Angeles Ry.
Pacific Electric Ry.
Steam R.R. lines

Transportation Plan Developed for the Metropolitan District of Los Angeles. Figures Indicate Number of Tracks



Both Elevated and Subway Lines Are Proposed for the Congested District



Passengers Outbound During the Afternoon Rush on a Typical Week Day

tion without placing an additional burden on the car rider. Where rapid transit construction is to be undertaken for existing interurban lines of the Pacific Electric Company, it is recommended that the savings effected in operating costs through increased speed in congested territory be capitalized as the interurban company's share of the construction costs. The report also proposes that an equitable portion of the construction costs be assumed by the community at large as a general benefit. This, however, would be a comparatively small part of the total.

In general, modern elevated structures are advocated for rapid transit lines except in certain highly developed locations where subways are considered necessary. Where property owners object to the modern type of elevated construction proposed the report suggests that the additional cost of subway construction, if this is demanded, be borne largely by special assessment against the property benefited.

For the purpose of studying the present and future transportation requirements of Los Angeles the present corporate limits of the city were disregarded. Instead the urban territory, comprising the developed area within a circle having its center in the business district, was treated as a transportation unit. In some instances this includes communities at present outside the corporate limits of the city and excludes large undeveloped areas that are included within the city limits.

A general summary of the estimated cost of construction is given in Table I.

TABLE I—SUMMARY OF ESTIMATES OF COST FOR IMMEDIATE CONSTRUCTION

(A) Rapid transit lines:	
1. Moneta-Broadway-Pasadena Avenue	$33,043,000
2. Hollywood-Vineyard	31,359,000
3. San Fernando Valley	4,678,000
4. Third-Seventh-Whittier Boulevard	28,951,000
(B) Surface lines	4,006,000
(C) Equipment—Cars, buses, substations, shops, yards, etc.	18,200,000
(D) Pacific Electric Railway expansion	13,148,000
Total	$133,385,000

TABLE II—STATEMENT OF TRACK MILEAGE OF THE COMPREHENSIVE TRANSPORTATION SYSTEM*

	Miles of Single Track				
	Existing or Under Construction	For Immediate Construction	For Future Construction	Total Construction	Unified System Totals
Subways and tunnels	1.8	26.1	15.4	41.5	43.3
Elevated railroads and depressed track	14.5	85.3	155.0	240.3	254.8
Total rapid transit lines	16.3	111.4	170.4	281.8	298.1
Street railways	572.3	41.6	62.7	104.3	676.6
Total mileage	588.6	153.0	233.1	386.1	974.7

* Within an area circumscribed by a circle having a radius of 8 miles from Seventh Street and Broadway.

In addition to the above, the program of future construction recommended is estimated to cost $190,000,000 at present price levels.

The track expansion proposed is indicated in Table II. The following rapid transit construction program is recommended for the initial period:

Moneta-Broadway-Pasadena Avenue rapid transit line extending through the city from Manchester Avenue on the south to Avenue 64 on the north. This line is to consist of an elevated railroad with the exception of the section between Washington Street and Sunset Boulevard, where a subway is recommended.

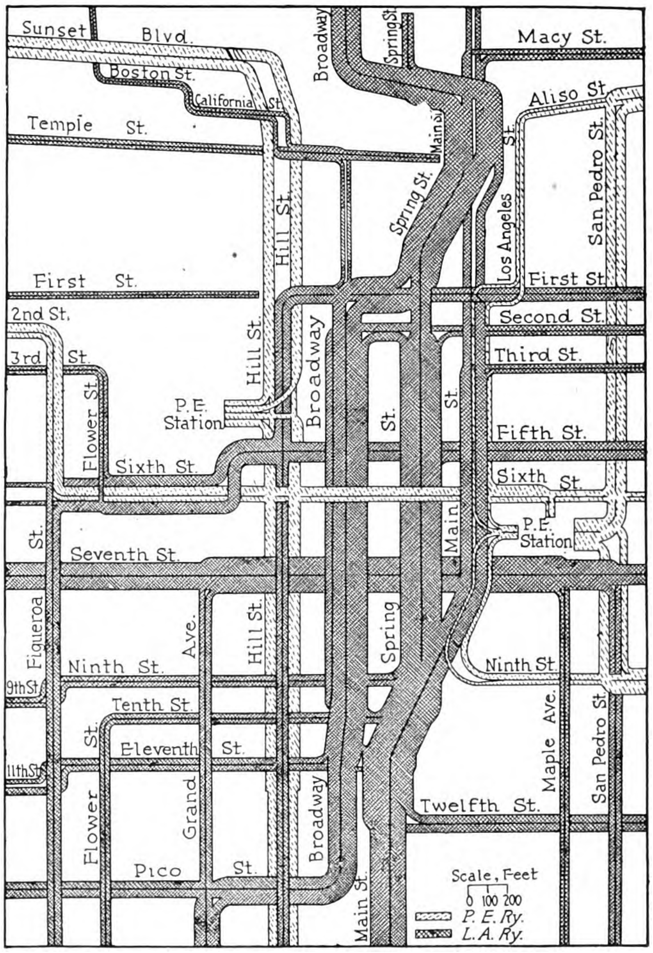
Hollywood-Vineyard rapid transit line connecting the north and northwest with the west and southwest sections of the city, following approximately the present Hollywood-Vineyard route of the Pacific Electric Railway. This line will consist of an elevated railroad and subway in Pico Street, the Broadway subway, the Hollywood tunnel and an elevated railroad on Glendale and Sunset Boulevard, with a subway in Hollywood Boulevard. Physical connections are to be made near Vineyard Junction with the Venice and Sawtelle lines, and at Glendale Boulevard and Montrose Street with the Glendale line.

San Fernando Valley line, to reduce the traveling time between the central business district and the San Fernando Valley. At the present time an interurban service is furnished in the San Fernando Valley by trains operating through the Cahuenga Pass. The new line will extend northwesterly on private right-of-way from a connection with the existing track of the Glendale line of the Pacific Electric Railway just west of the Los Angeles River to the Burbank-Chatsworth branch of the Southern Pacific Railroad, and then westerly to a connection with the existing Pacific Electric Railway line at Lankershim. It is to consist of an elevated railroad between Glendale Boulevard and Los Feliz Boulevard and a rapid transit railroad at grade from Los Feliz Boulevard to Lankershim. Elevated construction is to be used at important streets in order to eliminate grade crossings.

Third-Seventh-Whittier Boulevard rapid transit line extending across the city from Larchmont Boulevard on the west to Indiana Street on the east. This line is to consist of a subway in Third Street, Vermont Avenue, West and East Seventh Streets; also private right-of-way from Larchmont Boulevard to Stanford Avenue, and an elevated railroad along private right-of-way and Whittier Boulevard from Stanford Avenue easterly to Indiana Street.

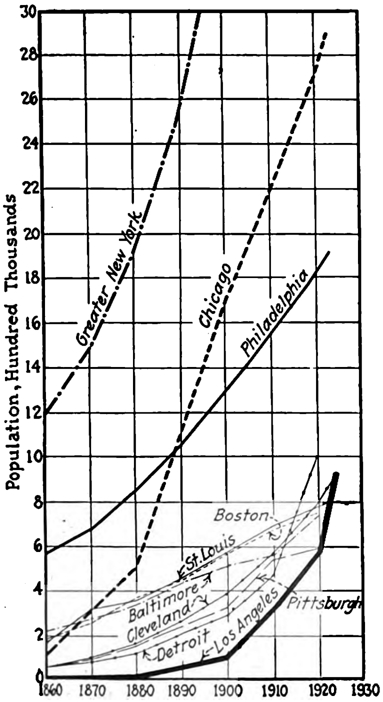
To provide an adequate system of feeders to the rapid transit line and at the same time to extend the local service it is recommended that the following surface line extensions be made.

Street	From	To
Downey Road	Ninth Street	Fifty-fifth Street
Euclid Avenue	Whittier Boulevard	Ninth Street
Fifty-fifth Street	Central Avenue	Downey Road
Fifty-fourth Street	Moneta Avenue	San Pedro Street
Fifty-fourth Street	South Park Avenue	Central Avenue
Florence Avenue	Western Avenue	Pacific Boulevard
Marengo Street	Daly Street	Soto Street
Melrose Avenue	Larchmont Blvd.	Vine Street
Ninth Street	Hooper Avenue	Downey Road
Soto Street	Marengo Street	Wabash Avenue
Vermont Avenue	Monroe Street	Los Feliz Blvd.
Vernon Avenue	Angeles Mesa Drive	Arlington Avenue
Vernon Avenue	Dalton Avenue	Vermont Avenue
Vernon Avenue	Pacific Boulevard	Downey Road
Vine Street	Melrose Avenue	Hollywood Blvd.
Wabash Avenue	Soto Street	Evergreen Avenue

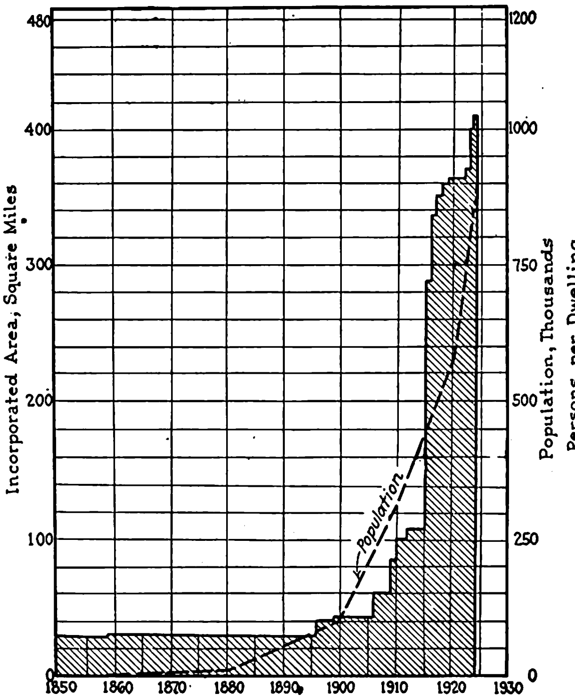


Car-Flow Diagram for the Congested District During the Rush Hour

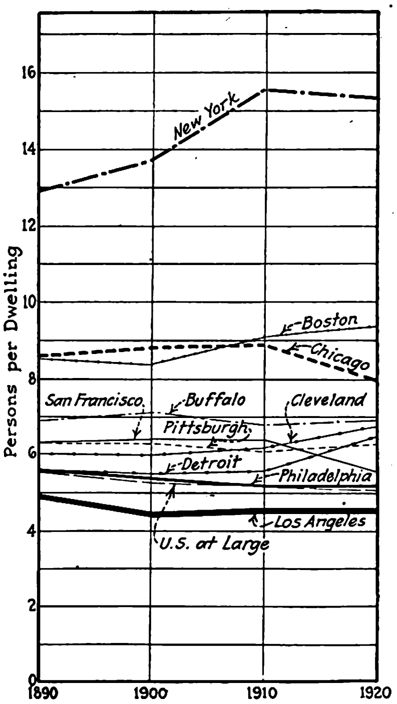
Additional bus lines are recommended. These include a bus route on Plymouth Boulevard, Eighth Street, Norton, Sixth and Seventh Avenues from Third Street to Exposition Boulevard. Another bus route is recommended for Manchester Avenue, extending from Western Avenue to Alameda Street. Still another route is proposed for Western Avenue, Los Feliz Boulevard,



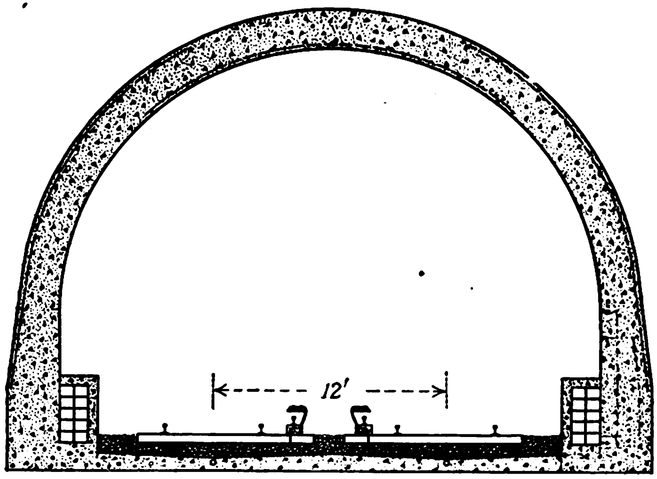
Comparative Growth of Population of Ten Largest American Cities, 1860-1924



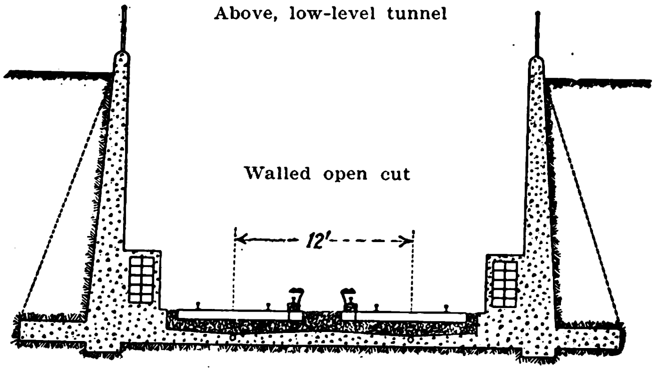
Growth of Area and Population of Los Angeles Compared, 1850-1924

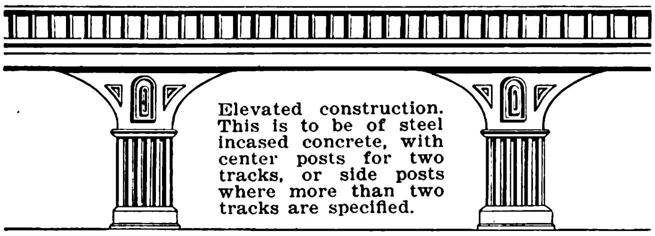


Persons per Dwelling for Ten Largest Cities of U. S.



Above, low-level tunnel





Elevated construction. This is to be of steel incased concrete, with center posts for two tracks, or side posts where more than two tracks are specified.

Types of Rapid Transit Construction Recommended for Los Angeles, in Addition to High-Level Subways

Central Avenue in Glendale, Colorado Avenue and Colorado Street, from Franklin Avenue to Fair Oaks Avenue in Pasadena.

Since the freight traffic on the lines of the Pacific Electric Railway as they exist on the east and south sides of the city prevents their co-ordination with the proposed rapid transit system, it is recommended that the Pacific Electric Railway make a number of improvements, some of which are now in contemplation by this company. These improvements include construction of a terminal elevated railroad easterly from a connection with the Main Street station elevated structure to a point just east of the Los Angeles River and then northerly paralleling the river to Aliso Street. A branch is to extend southerly from a point near Seventh and Alameda Streets to a connection with the Watts line near Fourteenth Street. The elevation of the existing four-track Watts line from Ninth Street to Manchester Avenue and the construction of two additional tracks on a short section of the Pasadena Short Line are also recommended.

All of the foregoing proposals are included in the program for immediate construction. The suggested future extensions of the system are shown on the accompanying map.

Under the new city charter of Los Angeles, the municipality is required to adopt a comprehensive elevated railroad and subway plan before any construction is authorized. This provision was made to avoid wasteful construction and to foster the development of a broad transportation policy and plan. The present report was prepared to supply this plan. It is based upon certain underlying principles which are summarized as follows:

> Future orderly development of Los Angeles requires the construction of rapid transit lines and the extension and expansion of other transportation facilities.
>
> If the city's unequaled position, when compared with other large cities with respect to the number of families per dwelling, is to be maintained, it must continue to spread, and this spreading must be accomplished only by providing rapid transportation at a reasonable rate of fare.
>
> Payment by the car rider of a fare sufficient to support all of the capital needed for rapid transit construction will require that the fare must either be substantially increased or the rapid transit system must be quite limited.
>
> By dividing the cost of transportation development proportionally between car riders, benefited property and the public at large, a comprehensive construction program can be undertaken and equitably financed.
>
> Only by the adoption of a comprehensive plan can a sound and economical construction program be prepared.
>
> The unification and operation by a single management of all the public transportation services within the urban area (an area circumscribed by a circle having a radius of approximately 6 miles from the central business area) is essential to first-class service.
>
> Existing facilities should be utilized in the greatest measure consistent with the development of the transportation system.
>
> The services rendered by rapid transit, interurban, street railway and motor bus lines should be co-ordinated, in so far as this is practicable.
>
> Extension and expansion of street railway and bus lines should include crosstown lines which will make the rapid transit route easily accessible.
>
> Grade separation at important highway crossings on the high-speed interurban lines in the outlying areas should accompany the construction of the proposed rapid transit lines, and additional highway crossings should not exceed the minimum number required to meet the public needs.
>
> The alignment of principal thoroughfares should be improved wherever possible by eliminating offsets. The radius of curbed corners should be increased in order to facilitate the movement of all street traffic.

In discussing the relative merits of subway and elevated structures for rapid transit lines, the report points out that elevated lines provide the facilities for travel in natural light and open air and are particularly adapted to the climate of Los Angeles. Attention is called to the vast improvement in the design of elevated structures since the first elevated railroads were built in Eastern cities. The recent construction in Philadelphia is cited as an example of the attractive appearance which may be incorporated in the design of such elevated structures. Based upon considerations of noise, street traffic obstruction and the appearance of a city, subways are held to be unquestionably superior to elevated railroads, but it is maintained that the service which can be provided in subways is no better than that which can be provided on elevated railroads. The report points out that the least expensive type of subway is from two to four times more costly than an elevated structure, and that the type of structure to be finally adopted must necessarily depend in a large measure upon financial limitations.

Comparisons are drawn indicating the relative advantages and disadvantages of various types of sub-surface and elevated structures for rapid transit lines. Construction cost estimates of the various types of structures considered are shown in Table III.

Illustrations of several types of sub-surface and elevated structures considered are shown. Estimates of the cost of two-track high-level subway construction

TABLE III—COMPARATIVE ESTIMATES OF COST
Double Track Rapid Transit Structures, Including Two Stations per Mile and Excluding Right-of-Way

	Cost per Mile of Road
Sub-surface structures	
Depressed track (with retaining walls)	$3,500,000
High-level subway (downtown district)	4,600,000
High-level subway (residential district)	4,150,000
Subway (tunnel construction between stations)	3,500,000
Elevated structures	
Solid fill elevated (with retaining walls)	1,500,000
Steel incased in concrete	
Ballasted deck, double columns at curb	1,600,000
Ballasted deck, double columns in roadway	1,500,000
Steel	
Ballasted deck, double columns at curb	1,250,000
Ballasted deck, double columns in roadway	1,200,000
Ballasted deck, single column in roadway	1,350,000
Open deck, double columns at curb*	850,000
Open deck, double columns in roadway*	800,000

* None recommended.

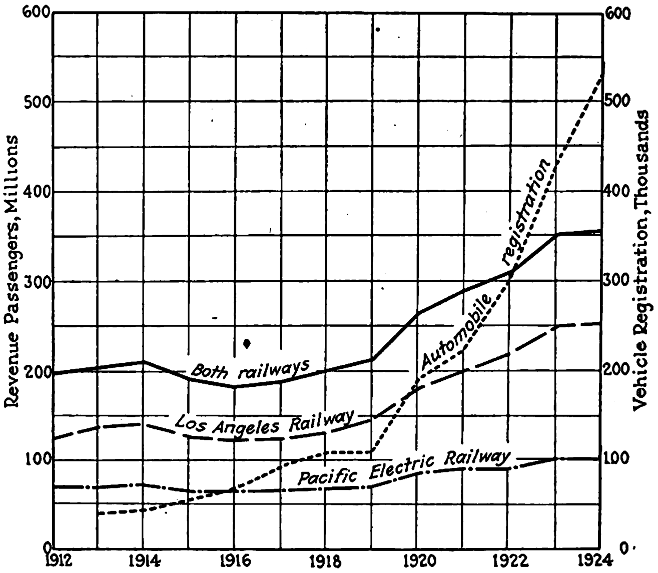
were prepared, one for the downtown district and the other for the residential district. These respective costs are $4,600,000 and $4,150,000 per mile. The high-level subway is the most expensive of all the structures considered in the report, and for this reason is recommended only for use in the downtown area where proximity to the surface of the street and consequent short stairways to station platforms are an advantage. The shales which underlie most of the hilly territory in Los Angeles were found to be well adapted to low-level subway construction by tunneling. It was concluded that the tunneling method of construction is quite practicable and will provide the most economical underground construction over a large part of the proposed subway route. This method of underground construction is particularly recommended for the residential districts. The plan is to have track grade come close to the surface of the ground near stations, at which points the high-level subway structure will be used. Estimates of cost based upon this combination of tunnel and high-level subway construction show that a two-track subway can be constructed for $3,500,000 per mile, or $650,000 less than the cost of high-level subway construction throughout. Tunnel construction is considered to have a further advantage over high-level subways in that there is but little interference with the utilities and drainage structures in the street and but very slight interference with street traffic during construction.

Stations on the rapid transit lines have been tentatively located on a general basis of ¼ mile spacing in the heavy loading zone of the central business district, and ½ mile spacing in the intermediate and outlying districts.

Careful studies of the riding habits and growth in population of Los Angeles were compared with experience in other cities in order to derive the probable income of the complete transportation system. The estimated total investment after the completion of the immediate construction program is shown in Table IV. This also shows the estimated annual interest charges, assuming 7 per cent cost for new capital.

TABLE IV—ESTIMATED INVESTMENT AND INTEREST CHARGES, IMMEDIATE PROGRAM FOR LOS ANGELES

	Investment	Interest
Existing properties	$55,000,000	$3,300,000
Street railway and bus lines	7,006,000	490,420
Rapid transit tracks, appurtenances, equipment, etc	30,533,000	2,137,310
	$92,539,000	$5,927,730
Elevated railway structures	32,925,000	2,304,750
	$125,464,000	$8,232,480
Subway structures	49,773,000	3,484,110
Total	$175,237,000	$11,716,590



Annual Revenue Passengers on Electric Lines Serving Los Angeles Compared with Automobile Registration in Los Angeles County, 1912-1924

It is assumed that about ten years will be required to complete the work recommended for immediate construction. At the end of 1935 the annual net revenues based on various rates of fare were estimated as follows:

Fare	Net Revenue
5 cents	$5,230,000
6 cents	7,350,000
7 cents	9,850,000
8 cents	13,030,000

It was therefore evident that a minimum fare of 8 cents would be required to support the investment in the properties after they had been expanded. In place of this increased burden on the car rider, it was urged that the major cost of construction be financed by special assessment against the benefited property.

Quick Change of Signal System

OWING to the growth of traffic at Ealing Common station on the Metropolitan District Railway, London, England, a change in the signal system became necessary. This was handled with great dispatch by the railway's engineering staff while the line was under traffic.

Complete dismantling and removal of the old mechanical signal frame, replacement of the old signal cabin floor and installation of the new power frame complete with relay rack fitted up with the necessary relays and wiring were involved. In addition, all switches had to be changed over from mechanical to electrical action.

A schedule allocated definite work to each of the 47 men. After the passing of the last train at night the frame was pulled to pieces and by 3 a.m. it had been removed. The floor was out by 4.30. By 7 o'clock the new floor was in position for the new power frame. By 4.30 p.m. the frame was erected and most of the wiring completed. The wooden casing and the new illuminated diagram were next fixed. By 10.30 a.m. the next day the whole of the apparatus was ready. At the same time the new relay rack had been fixed and the relays coupled up. Meanwhile, six pairs of switches on the main road were taken out on the first night and the tracks run straight through. Afterward the new layout into the depot was gradually installed, the new switches being power operated. The signals at Ealing Common were made to work automatically during the changeover.

The Readers' Forum

Dispatching Methods for Single-Track Interurban Operation

NEW HAVEN, CONN., March 23, 1925.

To the Editor:

During my twelve years of experience as an interurban motorman I have seen a variety of methods of operating interurban cars on single-track lines. These include verbal orders, home-made rules, hand-operated block signals, trolley-contact block signals, bulletins instead of written time-tables, the staff system, the standard code of rules revised to meet local conditions, single-form train orders, the positive meet system, and the A.R.A. standard rules with double-form train orders.

For light interurban lines running single-car trains with no heavy freights and not very high speed, I believe the trolley-contact block signal is the best. The oral telephone order with no written time-table is the most dangerous.

For the heavy interurban that operates more than one car per train and operates also heavy freight trains of from 10 to 50 cars, there is only one system that gives maximum safety, i.e., the standard A.R.A. rules with double-form train orders, used in connection with block signals operated by track circuits. The positive meet system is better for interurban roads than the time-card meet or superiority by direction. These involve too much red tape for the average interurban. Such important roads as the New York, New Haven & Hartford and the San Francisco & Sacramento and others have used positive meets for years with great success.

Some light interurban lines have dispatching systems that would do credit to a main-line steam railroad, while some of the heavy lines are very careless. These, however, are in the minority. Of course, it is not possible for all heavy interurban lines to have track circuit block signals, but the operators of such lines should at least have the standard form of train rules and see that the men obey them.

Once I worked for a heavy interurban road that actually encouraged its men to slight the rules in order to speed up the movement of trains. Happily that type of interurban is disappearing. Nowadays most roads believe in operating according to the rule book. Fifty years of railroad experience has proved it doesn't pay to make the rule book just a matter of form. If trainmen are allowed to supplement the rule book with so-called "horse sense" or judgment there is bound to be a conflict of methods that eventually causes a wreck. If you take chances you may win for several years but you only lose once, and a gambler always loses in time.

Trolley-contact block signals and the practice of operating cars from one siding to another without train orders are all right within certain limits. These signals are not designed for roads that do practically a steam road business. Though it is a great temptation for such roads to abolish train orders it cannot be done without jeopardizing safety. If you are operating trains with more than one trolley up through blocks protected by trolley-contact block signals you are creating a hazard, especially with the non-counting type of signal. The second or third trolley may clear the signal after it is first set. There are many other ways a train crew can get into trouble unless train orders are used to check the signals.

If operating passenger cars in trains and freights with electric locomotives, there is only one safe way to do—advance the trains by written double-form train orders. Don't expect the block signals to do the train dispatching. If using the standard rules there is absolutely no excuse for using single-form train orders. The dispatcher has trouble enough without increasing his worries with single-form orders that have been obsolete on the steam roads for years. The fact that you have few operators along the line is no excuse for following this dangerous and unnecessary method.

FRANK X. ROLLINS.

Large Bus Operations Analyzed

COMPARATIVE figures covering bus operations in America's two largest cities and the national capital have been prepared by John A. Beeler, consulting engineer, New York City. These are of interest to electric railway men as indicating results of bus operations on a large scale.

In New York and Chicago the double-deck type of bus operated by two men is standard, while in Washington the one-man single-deck type was used throughout last year. In the latter city double-deckers were first installed in February of this year. At the present time there are four double-deck buses in service and four more on order. Duplex single-deck buses which were in use during 1924 were replaced the early part of this year with Mack single deckers.

The fare in each of the three cities is now 10 cents,

TABLE I—BUS TRANSPORTATION IN NEW YORK, CHICAGO AND WASHINGTON COMPARED

	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Operating revenue (*a*)	$5,868,619	$4,990,434	$338,293
Operating deductions (*b*)	4,228,282	4,168,534	321,558
Taxes	594,364	326,871	2,149
Total operating deductions	4,822,646	4,495,405	323,707
Net earnings	1,045,973	495,029	14,586

(*a*) Includes passenger revenue and other revenue from operations.
(*b*) Includes operating expenses and reserve for renewals and retirements.

TABLE II—COMPARATIVE BUS STATISTICS

	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Passengers			
Passengers carried (revenue)	57,136,492	49,268,427	3,929,572
Passengers carried (transfer)	3,788,215	(*e*)	127,975
Passengers carried (total)	60,924,707	(*e*)	4,057,547
Service			
Maximum cars in daily service	308	313	36
Average seats each	51	63	22
Revenue miles	10,432,945	12,542,880	1,595,734
Revenue hours	1,295,819	1,245,763	152,454
Miles per hour	8.07	10.07	10.47
Passengers per revenue mile	5.83	3.93	2.55
Seat miles per passenger	8.75	15.93	8.65
Average length total ride, miles	2.58	4.27	2.00
Average per cent seats occupied	29.40	30.40	21
Fares			
Cash rate of fare, cents	10.00	10.00	(*c*) 10.00
Receipts per revenue pass., cents	10.00	10.00	(*d*) 8.50
Receipts per total pass., cents	9.39	....	(*d*) 8.23
Amount paid per mile per pass. ride, cents	3.88	2.34	(*d*) 4.11
Earnings per hour			
Operating revenue per hour	$4.54	$4.01	$2.22
Total operating deductions, including taxes, per hour	3.73	3.61	2.12
Net earnings per hour	.81	.40	.10

(*c*) Fare raised May 1, 1924 from 8 cents cash to 10 cents cash or three tokens for 25 cents.
(*d*) Average for year.
(*e*) No record.

TABLE III—EARNINGS, OPERATING RATIO AND INVESTMENT OF LARGE BUS COMPANIES

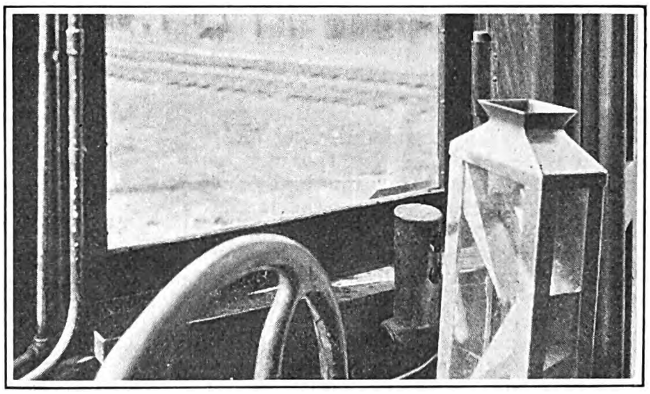
	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Earnings per mile			
Operating revenue per mile, cents	56.1	39.8	21.2
Total operating deductions, including taxes, per mile.......	46.2	35.8	20.3
Net earnings per mile..........	9.9	4.0	0.9
Distribution of revenues			
Per cent of operating expenses to total operating revenue......	72.0	83.5	95.1
Per cent taxes to revenue.......	10.1	6.5	0.6
Per cent net earnings to revenue.	17.9	10.0	4.3
Investment			
Total..........................	$4,321,000	$6,555,000	$182,940
Per dollar of total operating revenue....................	$0.74	$1.31	$0.54
Per passenger carried, cents.....	7.1	13.3	4.5
Per cent return on investment...	24.2	7.5	8.0

although until May 1, 1924, the Washington Rapid Transit Company charged 8 cents. After that date the 10-cent fare was started with three tokens for 25 cents. This rate continued for the remainder of the year.

Information included in the tables is all from authoritative sources. Mr. Beeler has included operating deductions and taxes to give a true comparison of the companies. It is interesting to note that the Fifth Avenue Coach Company was easily the leader in earnings with receipts of 56.1 cents per mile and giving 24.2 per cent return on the investment. The Chicago Motor Coach Company earned 39.8 per mile, giving a return of 7.5 per cent on the investment; while the Washington Rapid Transit Company only earned 21.2 cents per mile. On account of much lower operating expenses it was able to return 8 per cent on the investment.

A wide difference in the number of passengers per revenue-mile is shown, the Fifth Avenue Coach Company carrying 5.83, the Chicago company 3.93 and the Washington company 2.55. On the other hand the Fifth Avenue company has considerably lower speed, averaging 8.07 m.p.h., while the Chicago and the Washington companies have 10.07 and 10.47 m.p.h. respectively. Other information is given in the accompanying tables.

Illuminating the Fare Box



Shrouded Lamp Illuminates Fare Box

LAMPS of a standard type are used for illuminating the Cleveland fare boxes of the New York State Railways. The lamp is installed on a condulet fitting and is provided with a sheet steel guard having two holes on the side nearest the fare box. The location of the fare box is at the front end of the vestibule next to the door opening, and the condulet for the lamp socket is installed on the dasher.

Association News & Discussions

Traffic Congestion Discussed in Los Angeles

Newly Organized Branch of Society of Automotive Engineers Hears of the Conditions Existing in Los Angeles and a Comparison with Other Large Cities—Possibilities of the Bus as a Means to Secure Traffic Relief

DR. WILLIAM McCLINTOCK of the Los Angeles Traffic Commission and P. B. Harris, chief engineer Los Angeles Railway Corporation, were the speakers of the evening at a meeting of the newly-organized branch of the Society of Automotive Engineers, at Los Angeles, on April 24. Dr. McClintock commenced by speaking of the problem of traffic congestion and its causes with reference to American cities in general. The principal causes of traffic congestion, in the opinion of the speaker, were due to the introduction of reinforced concrete and the construction of buildings of ever-increasing height. Cities now grow upward, the skyscrapers border on streets that were never designed to carry the traffic resulting. The streets of Los Angeles were planned for a pueblo of three, four or five-storied buildings, at most. One big building in the city now has to make provision in elevators, hallways and corridors for 100,000 persons per day. At Seventh and Broadway it has been estimated that 500,000 persons pass to and fro every 24 hours in street cars, in automobiles and on foot.

We have in the past 25 years, Dr. McClintock averred, emerged from the horse-and-man age into the automobile age. The registration of automobiles in the United States in 1905 was about 300; in 1925 it is expected to reach 18,000,000. Mr. Ford has stated that the saturation point is far off; but it should be remembered that a physical saturation may be reached before an economic one.

Los Angeles has an unusually high per capita wealth. The population per automobile is 2½; in New York it is nine and in Boston, seven. Los Angeles is the motorized city par excellence of the world, the number of registrations indicating that there is one automobile for each family of average size. These figures deflect attention to the problem of the individual motor car—the car in which one person only travels—which adds to the congestion of the city streets and complicates the traffic problem.

In the past the city traffic problem has been considered as a political question, efforts to ameliorate conditions prevailing being due to the solicitations of groups of individuals, most of whom were unacquainted with the underlying economics or technique of traffic control. By such method of solicitation the school-stop ordinance was introduced, which operated for nine months and resulted in an increase in accidents and further congestion. The traffic problem must be solved, Dr. McClintock insisted, by the adoption of methods used by engineers to solve similar problems. Allowable building heights must be reduced. There is ample excuse for tall office structures in New York City because of the size and geographic position of Manhattan Island, but there is no justification for similar structures in Los Angeles. It is regrettable that the idea is so prevalent that tall buildings alone can note prosperity and industrial expansion.

The use of automobiles and street cars on the same pavement results in friction—they are naturally retarding elements. Rapid transit facilities must be made attractive before people that can afford automobiles will use them. Below Fourteenth Street in New York City few automobiles are to be seen, which is due to the development of adequate rapid-transit facilities.

Proper street planning is an important factor in the relief of congestion, but in Los Angeles the streets that were designed for the traffic of a pueblo are forced to bear the traffic of a highly centralized industrial area. It is time to face the fact that the horse-drawn vehicle has been supplanted by an entirely different means of transportation. It is time to design streets for motor traffic.

The amelioration of traffic conditions in Los Angeles, which is a city of dead ends, involves the redesign of many existing streets and the cutting of new streets. The proportion of area devoted to traffic lanes in the city is 22 per cent of the total, as compared with 44 per cent in Washington, D. C. A consideration of the problems involved resulted in the formation, a year or so ago, of a traffic commission of three engineers, who have evolved what is know as the major traffic street plan. This is not original in detail, but is a composite of several known ideas and proved innovations. It recognizes the impossibility of redesigning downtown streets, mainly because of the prohibitive expense that would be involved. Its principal feature is the creation of what is known as a traffic quadrangle, the purpose of which is to surround the congested area with an adequate number of supplementary traffic arteries, which will pass around, not through, the congested area. It includes the provision of a truckway alongside the Los Angeles River, and several street extensions that will necessitate tunnels and viaducts, the ultimate result of which will be to bring outlying districts within easy reach of the downtown area. The plan has been adopted officially. Its consummation will necessitate an expenditure in all of about $300,000,000 and it is to be completed in about 25 years.

BUSES CAN AID RAIL SYSTEMS

The question "Can Motor Buses Relieve Congestion?" was answered by P. B. Harris, chief engineer Los Angeles Railway, in the negative. The removal of street cars, he maintained, would not help the present congestion. The motor bus, however, plays an important part as an aid to the street car system. It involves a smaller initial investment and its operating costs are lower. But as the electric railway service improves, Mr. Harris averred, conditions will be made more difficult for the bus. The street car is especially suitable for the meeting of heavy overload demands. Fewer units are needed to carry the same number of passengers, and the street car is less easily damaged than the bus. In the rush hours, and assuming adequate car service, there is no waiting. Crowding is inevitable at such times, but the service provided is as much as can be expected for the fare paid. Last Christmas an experiment was made in Los Angeles of increasing the number of cars in service in an effort to reduce overcrowding during rush hours. As a result the patrons arrived home an hour late, and subsequently showed preference for prior conditions.

Bus lines in a city should be operated by the company in control of the electric street car lines, so that a transfer system is practicable. Thus in Los Angeles, the Los Angeles Motor Bus Company is an offshoot of the Los Angeles Railway Corporation. The subsidiary is buying more buses, and it must be recognized, said Mr. Harris, that the newer method of transportation has a future. This is the conclusion after a year's operation. The Los Angeles Motor Bus Company has been well in advance in the introduction of improved equipment and was the first to use six-cylinder engines, air-braking systems and pneumatic tires on double-deck buses.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 12-13—**Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.**

May 14-16—**Massachusetts Safety Conference, Copley Plaza Hotel, Boston.**

May 19-22—**Chamber of Commerce of the United States, annual meeting, Washington, D. C.**

May 20-21—**Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.**

May 25-26—**Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.**

May 25-28—**National Association of Purchasing Agents, Milwaukee, Wis.**

May 27-28—**Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.**

June 2-4—**Central Electric Railway Association, French Lick Springs, Ind.**

June 3—**Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

June 3-4—**Iowa Electric Railway Association, Waterloo, Iowa.**

June 10-12—**Canadian Electric Railway Association, Montreal, Quebec.**

June 26-27—**New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

July 22-25—**Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

Oct. 5-9—**American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

Transportation at Chamber of Commerce Meeting

TRANSPORTATION will have a prominent place on the program for the thirteenth annual meeting of the Chamber of Commerce of the United States, to be held at Washington May 20, 21 and 22.

At a special transportation group session on May 21 a feature will be discussion from the floor on outstanding transportation problems which will be presented by leaders in this field. Carl R. Gray, president Union Pacific System, will outline the most important current developments in the railway field and measures for increasing the efficiency of the country's transportation system. The subject of "Regulation of Motor Carriers in Interstate Commerce" and the question of "Metropolitan Traffic Problems and How Chambers of Commerce Can Assist in Their Solution" will also be taken up. The latter subject will be handled by Harland Bartholomew of St. Louis.

Another feature of the group luncheon session this year will be the new method of considering resolutions to be acted on by the chamber at the annual meeting. Full consideration and debate on such resolutions will be arranged, and for this purpose all such resolutions will be presented as early as possible during the session and will be considered in detail at the end of the regular program.

Many general economic problems will be discussed at the convention, including some that are international as well as domestic in scope. Among the more important topics, as shown on the program, are the following: "The European Situation," "The Federal Trade Commission," "The Merchant Marine," "Agriculture" and "Business Conditions." The speakers among the higher government officials will include Secretary of Commerce Hoover, Secretary of Agriculture Jardine and Chairman Palmer of the Shipping Board. Leading business men also will discuss the subjects selected. A feature of the meeting will be the formal dedication of the chamber's new headquarters building at Washington, recently completed.

Traction Motors Discussed at Hague Meeting

RATING of traction motors was one of the important subjects discussed at the Hague meeting of the International Electrical Congress, held April 16-21. This meeting was attended by about 100 delegates, including several from the United States. The plan adopted of introducing new subjects by the reading and discussion of papers prepared by experts has given excellent results, clearing the air for definite proposals or rules later. This saves much time in the discussion of rules. The plan was used of introducing the subjects of traction motors and transformer oil, advisory committees meeting on these for the first time.

The one-hour rating for traction motors, which was advocated by the United States committee, was objected to on the grounds that it had no scientific basis and no definite relations to service conditions. It was agreed, however, that traction motors require some test other than that necessary to determine temperature limits on continuous load, and the principle of the one hour plus the continuous rating was adopted unanimously. The United States committee proposals as to temperature rises were substantially met by some of the other nationals, and the United States proposals were finally accepted.

The proposals for commutator temperatures recommended by the Congress for adoption are:

For the one-hour test, 90 deg. C.

For the continuous test, 85 C.

The American proposal was for 95 and 80 deg. respectively. All tests are to be made with covers as arranged for service. Efficiency is to be based on the summation of losses corrected to 75 deg. C., but not to include gear losses.

Other subjects taken up were terminal markings, ratings of electrical machinery, prime movers, lamp bases and sockets, symbols, vocabulary, and transformer oil. On the last subject much interest was shown and plans were furthered for making tests through co-operation with the American Society for Testing Materials.

Purchasing Agents to Meet in Milwaukee

A COMPREHENSIVE program has been worked out for the forthcoming tenth annual Purchasing Agents' International Convention and Informa-show in Milwaukee, May 25 to 28, inclusive. The sessions will be held in the Milwaukee Auditorium. The general convention sessions, opening May 25, will be held in Plankinton Hall, which has a seating capacity of more than 1,200.

The afternoon of the opening day will be given over to sectional meetings. Tuesday morning the second general convention session will be held in Plankinton Hall. It will open at 9 a.m. with a general discussion on scrap specifications and their value to all members. The afternoon session will again be given over to sectional meetings.

The usual order of business will be reversed on Wednesday, the morning being given over to the last of the sectional conferences, with the general convention session in the afternoon. In the morning the last meeting of the fuel conference will be held in Engelmann Hall, that of the public utility conference in Conference Room A and the meeting of the oil company buyers' group in Conference Room D.

Program for Canadian Convention

PRELIMINARIES for the 1925 convention of the Canadian Electric Railway Association are well under way. This convention will be held on June 10-12 jointly with the convention of the Canadian Electrical Association. Meetings of both associations and an exhibition of equipment and supplies will be held on the fifth and sixth floors of the Henry Morgan & Company, Ltd., Building, Union Avenue, corner of St. Catharine Street, Montreal.

Arrangements have been made for the presentation of two papers: "Recent Car Designs and Their Relation to Operating Conditions," by J. Metcalf, traffic department, and W. R. McRae, rolling stock and shops department, both of the Toronto Transportation Commission; "The Business of Selling Rides," by Walter Jackson, fare and bus consultant, Mount Vernon, N. Y.

A comprehensive report will be presented by the motor truck and bus committee of the association, F. D. Burpee, chairman. This report was deferred from last year in order to gather further data.

Entertainment features will include a golf match on June 10, followed by a dinner dance at the Golf Club and a dance at the Windsor Hotel on June 11.

Midwest Motor Transport Conference Program

HIGHWAYS as avenues of commerce and the relation of the electric railways to motor transport will be the principal topics of the Midwest Motor Transport Conference to be held at the Hotel LaSalle, Chicago, Ill., on May 27-28 under the auspices of the National Automobile Chamber of Commerce. One of the principal speakers will be Secretary of Agriculture William M. Jardine, whose topic will be "The Public and Highway Transport." Papers of particular interest to electric railway men will be "The Relation of Highway Transport to Other Transportation Agencies," by A. J. Brosseau, president Mack Trucks, Inc.; "The Electric Railways and Highway Transport," by Charles W. Chase, vice-president Chicago, Lake Shore & South Bend Railway and president Gary Street Railway; "The Field of the Motor Bus," by John A. Ritchie, president Chicago Motor Coach Company; "Economics of Motor Bus Operation," by H. A. Mullett, assistant general manager Milwaukee Electric Railway & Light Company; "Is Regulation of Interstate Motor Vehicles Necessary?" by T. R. Dahl, vice-president the White Company.

Central Master Mechanics to Meet at French Lick

IN ORDER to get the work of the newly organized Central Electric Railway Master Mechanics' Association under way, a special meeting of the association will be held at 2 p.m. on June 3. This meeting will be held in connection with the summer meeting of the Central Electric Railway Association at French Lick Springs, Ind. There will be no prepared program, the session being devoted entirely to committee work and discussion of such items of importance as may be presented.

Kansas City Scene of Midwest Meeting

SUBJECTS of vital interest to electric railways will be on the program now being arranged for the annual meeting of the Midwest Electric Railway Association. This will be held at the Baltimore Hotel in Kansas City, Mo., May 25 and 26.

American Association News

Engineering Symbols

A MEETING of the committee on engineering symbols was held at association headquarters, New York, on May 6. Those present were: H. R. Stamm, chairman; R. C. Cram, sponsor; H. W. Codding, C. W. Squier and W. Quinn, who represented J. F. Neild. Tracings of symbols were presented for each of the groups being considered by the committee. Agreement was reached as to topographical, building and structures, electrical railroad, mathematical, and mechanical symbols. Many of the tracings were in finished form, so that cuts can be made for the final report. Other groups were brought up so that final tracings can be made at once. The work completed is very extensive.

Special Reports Available

THE following special reports have been prepared by the Bureau of Information and Service of the association and are available to member companies in good standing upon request:

Bulletin No. 21. *Electric Railway Operations in* 1924. Contains a summary of the revenues, expenses, net revenue and passenger traffic of 370 companies in 1924 in comparison with the same items in 1923. Also contains complete comparative analyses of the operations of 261 companies classified into city, interurban and combination city and interurban companies and further classified into three smaller groups according to the size of the company. For each group there is shown a complete income statement, detail of operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 22. *Bus Operations of Electric Railways in* 1924. A summary and analysis of the bus operations of 58 electric railways, and a tabulation of the individual returns with certain of the more important figures shown on a unit basis for the purpose of more accurate comparison. In addition it contains combined statements for all of the companies covering revenues, expenses, net taxes, car-miles, passengers carried, gasoline consumption and the number of buses operated, with a summary of methods of depreciation adopted by the various companies.

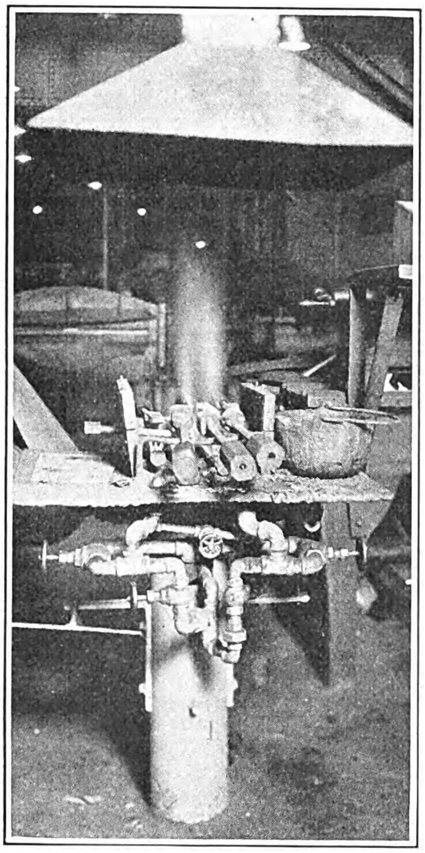
Bulletin No. 23. *Special Factors Affecting the Working Conditions of Electric Railway Trainmen.* A tabulation of information covering a number of miscellaneous conditions, such as the allowance of time off periodically, giving of vacations, establishing of pension systems and systems of employee representation, companies' contribution to cost of uniforms, labor turnover, union affiliations of trainmen, etc.

Bulletin No. 24. Selected Exhibits Presented by Electric Railways in Washington Arbitration Proceedings. This is a revision of the compilation issued June 1, 1924, and contains copies of exhibits used in arbitration cases occurring in the last year. They have been selected from a large number of exhibits because it is believed they present in an effective way the facts on the subject they treat of and will be valuable to many companies preparing for an arbitration case. Some of the subjects covered are: Wages in relation to cost of living, relation of trainmen's wages to wages in other local industries, family budgets of trainmen, nature of trainmen's work and skill required, average wages earned, size of trainmen's families, company's financial condition, effect of wage increases, improvement in working conditions, etc.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin and Cost of Living Studies (Bulletin No. 25) have been prepared, bringing them down to date.

Maintenance of Equipment

Convenient Heater for Soldering Irons

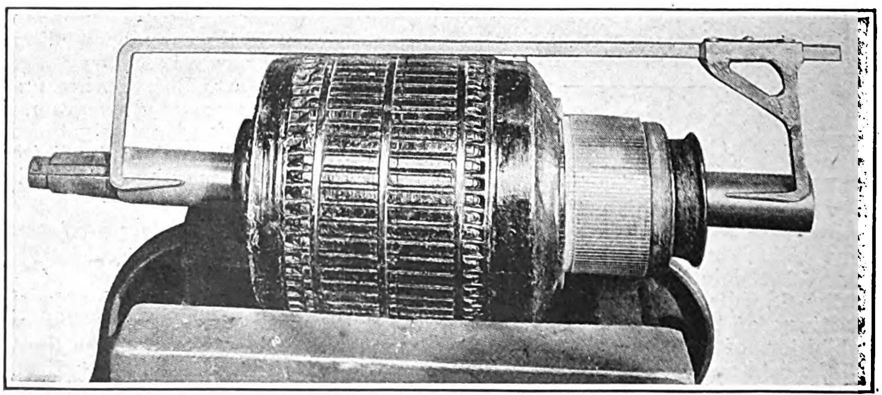


Soldering Irons Are Heated in a Centrally Located Gas Furnace in the 65th Street Shops of the Third Avenue Railway

SOLDERING irons are heated conveniently in a gas furnace installed in a central location in the armature room of the 65th Street shops of the Third Avenue Railway, New York City. The table and burners are 30 in. above the floor and a central support is provided by a 6-in. pipe which is imbedded in the concrete floor. The various pipes for supply of air and gas, with suitable control valves, are arranged about this central support. Half-inch pipe and fittings are used for the connections. There are four horizontal burners. These are surrounded by a rack, so as to hold the soldering irons in place and provide a grating support over the burners. A pilot light is also provided so that the burners light automatically whenever gas and air are turned on. The top sheet steel support is extended outside of the rack for the soldering irons so as to provide convenient shelves to hold pots for soldering salts and solder. A sheet-steel hood is mounted over the burner to receive and carry off any fumes. This arrangement of a centrally located gas furnace does away with the necessity of each workman having a furnace to heat his iron during soldering operations. The location has been selected so that it is convenient to all.

Calipering Inside End Bells of Armatures

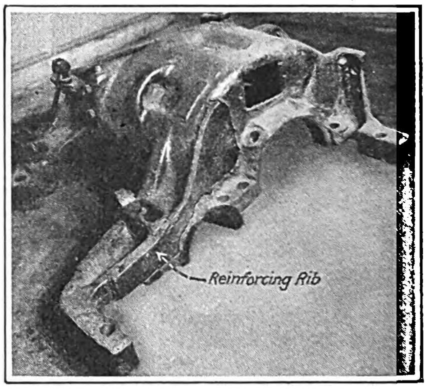
IN ORDER to provide uniform dimensions between the end bells of armatures of the same type the New York State Railways in its Utica Park shops uses a special outside caliper made in the shop. A bar of ½-in. x ⅝-in. cold-rolled steel with one end bent down into an inside projection with pointed end forms one arm. A scale graduated in sixteenths of an inch is marked along the top edge of the bar. The sliding arm of the caliper consists of a casting with the slide accurately machined to fit the bar. The lower part has a projection with pointed end the same as the opposite end of the bar. Friction for the slide on the bar is provided by two bronze studs which are held in firm contact with the bar by a flat spring. This spring is secured to the arm at its center, leaving the ends free to bear on the outside end of the bronze studs. The accompanying illustration shows method of using the gage in measuring up an armature. This particular gage will take armatures with a 20-in. diameter core.



A Shop-Constructed Outside Caliper Used for Gaging Armature End Bells

Reinforcing Rib Welded on Motor Case

GEAR case supporting arms on Westinghouse No. 306 motors have been reinforced with a secondary rib welded to the motor case by the City Railway of Dayton, Ohio.



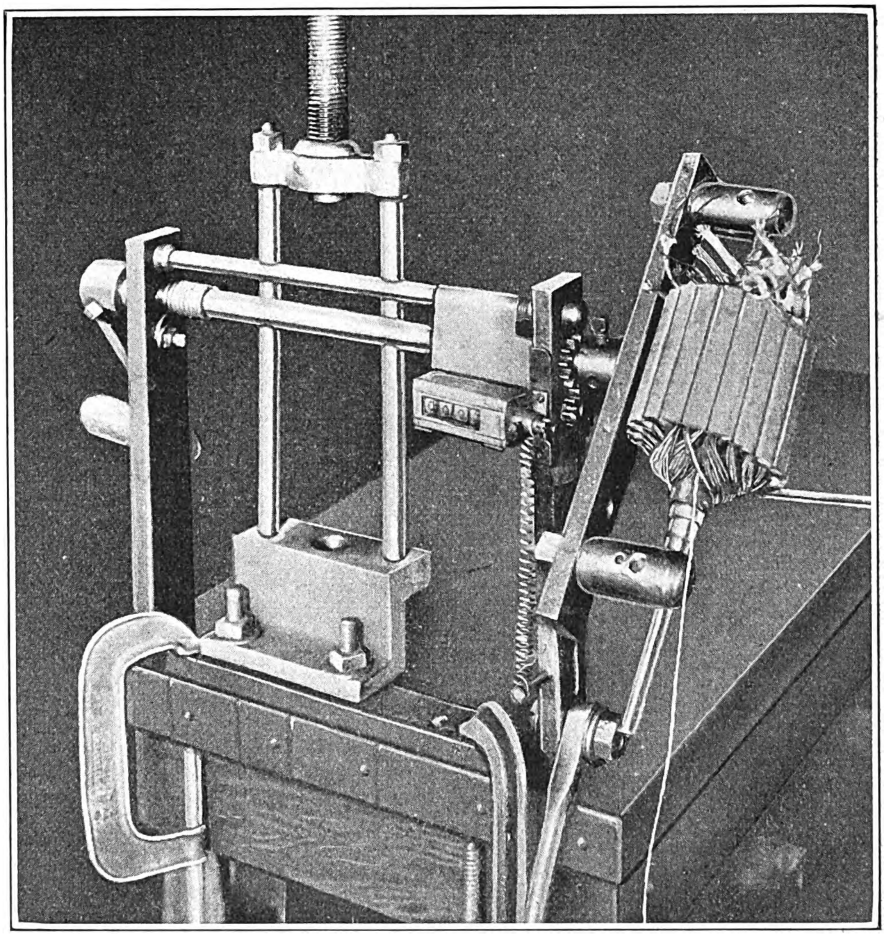
Broken Motor Gear Case Arms Are Repaired by the City Railway of Dayton with a Reinforcing Rib Welded to the Motor Case

Some difficulty has been experienced from breaking the gear case arm. The new reinforcement has been found to overcome the difficulty entirely. It consists of a ⅝-in. thick steel plate, cut and formed to the proper shape to fit the motor case. Putting the rib in place is a simple shop job. It is welded in place with a Wilson welder. Broken cases have been repaired by this method and are found to be stronger than when new. A jig was made up to hold the broken arm in place during the welding. This is so designed that the axle bearing housing is maintained in correct alignment while the repair is being made.

Air Cylinder Presses Out Bearings

IN THE Chelsea shop of the Eastern Massachusetts Street Railway a convenient apparatus has been devised for pressing in and out armature bearings. The pressure is supplied by a 16-in. air cylinder formerly mounted on a coal car and used for dumping the hopper. This cylinder is located on the floor alongside the wall of the building with the piston end up. It is controlled by an engineer's valve. The bearing is placed on a table about 6 ft. away from the wall. By an arrangement of levers the upward movement of the piston of the air cylinder causes a downward movement against the armature bearing and presses it out.

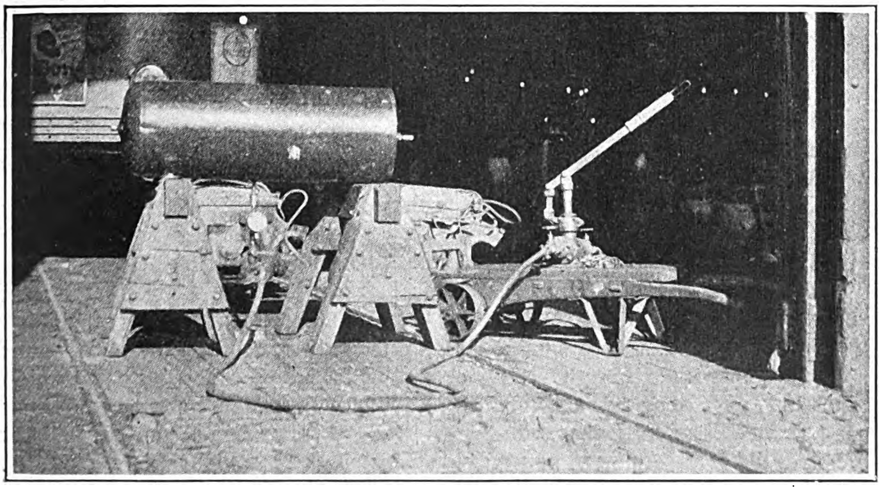
Winding Machine for Small Armatures



Small Armatures Are Wound on This Machine at Utica, N. Y.

SMALL armatures are rewound in the Utica Park shops of the New York State Railways on the device shown in the accompanying illustration. A rotating head with bearings which can be adjusted to suit various sizes of armatures is turned by a crank at the opposite end of the shaft to which it is attached. Gearing from the shaft drives a counter to record the number of turns.

A novel feature of this machine is the method used to prevent back-turning of the handle. A coil spring surrounds the shaft tightly at the crank end. One end of this spring is fastened to the upright support while the other end is loose. Turning the handle in the proper direction opens up the spring so that movement is not interfered with, but on an attempt to turn in the opposite direction the spring at once grips the shaft to such an extent as to prevent further motion. This simple arrangement has worked very satisfactorily. The machine is held on the bench by C clamps and can be removed readily.

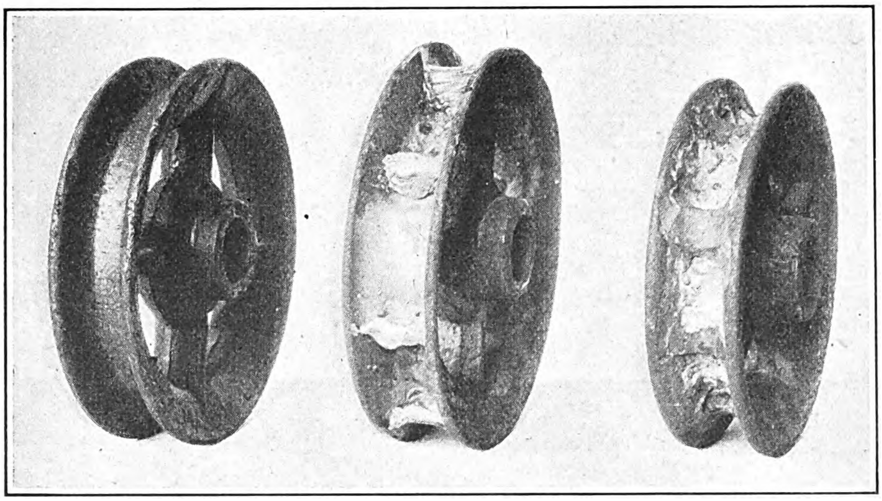


A Few Strokes of This Hand Pump Produce a Pressure of 150 Lb. per Square Inch for Testing Air Tanks

Hydraulic Testing of Air Tanks

ON THE Eastern Massachusetts Street Railway cars are overhauled every 75,000 miles and air tanks are thoroughly tested. The tank is taken off the car, cleaned, examined and painted with red lead. It is then tested under hydraulic pressure and if found to be in good condition it is stenciled with the date of testing and replaced under the car.

In making the test the tank is supported on two wooden horses, as shown in an accompanying illustration. A short piece of pipe with a valve and pressure gage is attached to the outlet pipe. A hose connected to a hand pump and from there to a water faucet is then attached to the tank. An escape valve is allowed to remain open until the tank has been completely filled with water. This is then closed and a few strokes of the pump serve to bring the pressure up to 150 lb. per square inch, the maximum required for the test. If no holes in the tank are disclosed at this pressure it is considered sound and is returned to service.



Making Sleet Cutters Out of Worn Trolley Wheels
At left—Worn trolley wheel. In center—Wheel with spots welded in place. At right—Sleet cutter after having been in service.

Making Sleet Cutters from Worn Trolley Wheels

SEVERE weather conditions are of frequent occurrence on lines of the New York State Railways, and provision for removing sleet from the trolley wire is quite essential. A very effective form of sleet cutter is made from a worn trolley wheel by welding spots of bronze into the groove at frequent intervals. The illustration shows the process as developed at the Wolf Street shop, Syracuse. The wheel at the left is one ready to be filled in. The center wheel has the spots welded in place, and the wheel at the right is one that has been in service.

Poles Reinforced with Rail

UNSALABLE slot rails removed from old cable track have been used to good advantage in the construction of reinforced concrete poles by the Market Street Railway, San Francisco, Cal. They have the same dimensions and appearance as the company's standard tubular poles.

New Equipment Available

Power-Driven Earth Drill

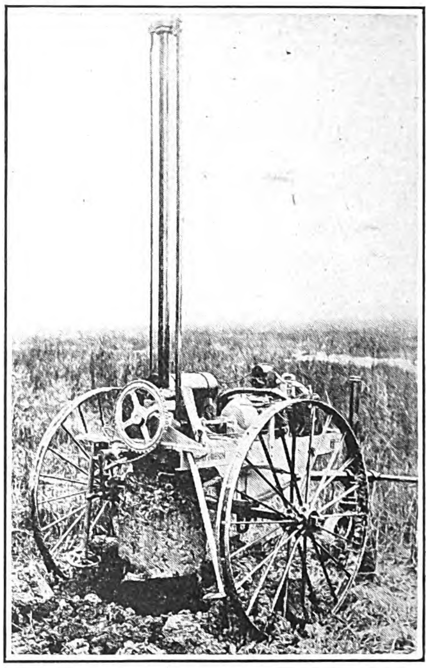
HOLES in earth, clay, shale or hardpan are dug easily with the Buda-Hubron earth drill, which has been placed on the market by the Buda Company, Harvey, Ill. Its use is suitable for pole-line work of all descriptions, as well as for fence posts, foundations and blasting operations. The drill proper, which is held in a specially designed chuck mounted on the drill spindle, is lowered or fed by hand and raised by power. The large-sized drills, made up to a diameter of 20-in., are formed of a single cast-steel helix polished on the top surface and provided with a special check valve. Removable manganese and carbon steel cutters are bolted to the helix and can be removed easily when worn. When the drill is lowered, the earth as it is loosened by the cutters is forced up through the check valve and slips on the polished top surface of the helix but does not turn in the hole with the drill. This feature means a large saving of power and is the secret of the digging capacity of the machine.

When about 2 ft. of earth has collected on the top of the drill, the drive clutch is disengaged and the drill raised to the surface by engaging the lifting clutch. The drive clutch is then engaged and the whirling drill throws the dirt around outside of the hole. Speed of drilling depends on the character of the ground. In heavy clay an 18-in. or 22-in. diameter hole can be sunk 6 ft. in three minutes. The number of holes dug per hour varies, due to the right-of-way conditions, but six holes an hour may be considered a fair average, although ten to twelve holes an hour have been dug under favorable conditions.

The drill is simple to operate. Being mounted on springs, the machine moves upward when the drill strikes an obstruction and drops back into place when the obstruction has been dislodged, thus removing undue strain on the drilling mechanism. The cone friction clutch, which connects the engine to the main driveshaft, is so designed that it will slip when the drill strikes an obstruction too large to be removed. All parts of the equipment are designed to stand severe and continuous service. Roller bearings are used on the main driveshaft, and large heat-treated gears running in oil are used in the drill head.

The engine is a standard Buda design of the four-cycle, horizontal, two-cylinder, air-cooled type of 4-in. bore and 4-in. stroke. It is equipped with high-tension magneto and gear oil pump.

This earth drill is made in two models. One is mounted on either steel or rubber-tired wheels and may be towed behind an automobile to the site of the work. It is used on rough and uneven ground, as it can be adjusted to drill at any reasonable angle. The other model of machine is designed for mounting on any standard motor truck. It is carried on a special sub-frame which is bolted directly to the floor of the truck body. With this arrangement, an adjustment of 25 deg. fore and aft and 20 deg. sideways is possible. This machine can be mounted on a standard platform truck in a few minutes and may be taken off readily when the truck is required for other work.



A Self-Contained Earth Drill for Pole Work or Blasting

The News of the Industry

Cleveland Labor Restive

Employees Threaten Strike Following Declaration of Open Shop and Announcement of Wage Advance

Open shop conditions have been in force on the lines of the Cleveland Railway since Tuesday night, May 5. Bulletins to this effect were posted at all the company carhouses after word had been received from Columbus that the State Supreme Court had refused to hear the appeal of the union from the decision of the Court of Appeals. The refusal of the State Supreme Court to grant the men a rehearing of their case marks an end of a struggle between the company and union continued for more than a year.

The bulletin said that henceforward there would be no contract between the union and the company. It was also announced that, effective on May 1, the company granted the men a wage increase of 5 cents an hour. This makes the new schedule of wages 60 cents an hour for the first three months of service, 63 cents an hour for the next nine months, and 65 cents an hour after the first year. There are no changes in any of the working conditions and no discrimination will be made between union and non-union men. These things the company has publicly proclaimed.

The union will meet within a few days to decide its future course of action. It is pointed out, however, that inasmuch as the courts have held the closed shop agreement illegal, it will be difficult for the men to call a strike against a court decision.

QUESTION A YEAR OLD

A year ago, when the men demanded a wage increase of 15 cents an hour, the company refused, and under the terms of its contract with the union, the demand went to an arbitration board. This arbitration board increased the pay of the men 12 cents an hour, but previous to the announcement of the award, the company withdrew on the ground that the key member of the arbitration board, James W. Holcomb, former city street railway commissioner, was biased and prejudiced against the company and that he had disqualified himself from sitting on the board by reason of having been indorsed by the carmen's union for a federal position. The union appealed to the courts to uphold the award.

The Common Pleas Court then ruled that the award was illegal on the ground of fraud, but sustained the closed shop contract. When both the men and the company appealed the case to the Court of Appeals, this court not only held the 12-cent wage award illegal but also set aside the closed shop contract between the company and men on the ground that it was contrary to public policy. It is this decision the Supreme Court has now sustained by refusing to hear the case.

At a meeting on the night of May 6 the men decided to demand a 10-cent increase instead of the 5-cent hourly increase which the railway ordered. In addition, the men asked a formal contract recognizing the union, although on open shop terms. The union executive committee on May 7 presented these demands to President John J. Stanley. He is expected to refuse anything more than the 5-cent increase. The union was to meet again on the night of May 7 to map out a future course. A strike does not seem imminent.

Increase in Fares Sought in Pasadena

The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for permission to increase its street car and motor coach fares in the city of Pasadena, as follows: 6-cent fares to be increased to 8 cents; school children's 40-ride books from $1.20 to $1.60; eight-ride tickets for 50 cents, instead of ten-ride tickets for 50 cents; 10-cent fares to be increased to 12 cents. The applicant presages the need for an increase on the fact that there is a deficit of $162,506 in railway and bus earnings.

Worcester Going Ahead

Railway There Joins Other Companies that Are Turning Bus to Their Advantage—Brief Review of Some of the Recent Moves—Responsible Operators Favored

DEFINITE developments in the plans which the Worcester Consolidated Street Railway, Worcester, Mass., is making with respect to the use of the bus by it give an indication of the attitude of the public mind in central Massachusetts. The Consolidated announced that it will soon restore service from Worcester to Leicester and Spencer and that there would be reduced rates through use of tickets to regular patrons. Selectmen of Leicester immediately made known that they would oppose the re-establishment of railway service, but would give no indication of how they would express such opposition.

Despite this the railway went right ahead with plans for the resumption of this service, asserting that it does not need the approval of the Leicester Selectmen to put the line back into service even though the suspension has been of six months duration. In the meantime buses are running from Worcester to Leicester, Spencer and even into Brookfields and enjoying large patronage, so much so that schedules have had to be increased and new buses added.

Recently the State Department of Public Utilities held a hearing on the petition of the railway to be allowed to operate buses in communities which its rail lines now serve. The department has not yet acted on the petition, but even if it is granted the railway will have to apply to the authorities of each town for bus licenses. The railway is preparing to compete with the independently owned bus lines so that there will be no delay if it receives authority from the state and the community.

In line with this policy the railway has applied to the Southbridge Selectmen for permission to operate buses between Worcester and Southbridge, with auxiliary bus lines from more distant sections of the town. Three other applications to operate buses from Worcester to Southbridge from private companies are also in the hands of the Southbridge Selectmen.

At Southbridge Charles C. O'Donnell, superintendent of the railway, urged exclusive rights for the railway on the ground of its previous record and emphasized that valuable freight and mail service could be given by the railway in conjunction with the bus service. W. W. Buckley, town clerk, said there were 29 jitneys in operation in Southbridge, none of which carried passenger insurance, which meant that the passengers must travel at their own risk. The Consolidated, if it can get the required permission, expects to get its Southbridge-Worcester bus service in operation by June 1.

Other bus routes planned by the railway are an express line to Southbridge by way of Oxford and Charlton, a line to Fitchburg through West Boylston, Sterling and Leominster from Worcester and several others. These would replace the trolley lines entirely rather than supplement them as in the case of Southbridge, Leicester and Spencer.

With reference to the city of Worcester the Consolidated is considering bus service from Lincoln Square to replace the Boynton Street trolley.

The Selectmen of Millbury, Mass., which is about 5 miles from Worcester, have settled the bus question for this year. They declare no licenses for buses will be granted. This action followed the report that the Worcester Consolidated, intended to establish a bus line. Town officials explained that they feared the railway might abandon its carhouse properties there and the town would be a big loser in the matter of taxation, if bus rights were granted.

Yonkers Electrification to Proceed

The Public Service Commission of New York on May 6 issued an order approving the plans of the New York Central Railroad for the electrification of the Yonkers branch of its Putnam division. The order provides that the existing system of electrification on the New York Central in New York City shall be applied. The company proposes to proceed immediately with the electrification of the two tracks of the branch.

The substations supplying power will be Mott Haven, Marble Hill and Glenwood. Plans and specifications for the proposed work must be submitted to the commission for approval before any construction work is done. The order also directs the railroad to file on or before July 1, 1925, a statement or detailed plans for the electrification of its so-called main line, Putnam division and Saw Mill River branch, north of the Yonkers branch.

597 Certificates at Boston

The Boston Elevated Railway, Boston, Mass., has completed its educational program for the season 1924-25. It consisted of a series of departmental group conferences arranged for each of the transportation, power, maintenance and rolling stock and shops departments and the women's group.

Certificates were awarded to 597 employees, divided by groups as follows:

Transportation	214
Power	112
Maintenance	139
Rolling stock and shops	100
Women's	32
Total	597

The program was described in the ELECTRIC RAILWAY JOURNAL for Nov. 1, 1924, and Feb. 14, 1925.

Bill for Indeterminate Franchises in Illinois

Utilities of Illinois as represented in several associations have settled upon the principle of indeterminate permits instead of franchises in the present storm of prospective legislation aimed to avert the Chicago transportation crisis due at the expiration of franchises in 1927. The bill best fitted, in principle, to meet the present situation is the so-called Barr measure, now before the Legislature, but it is being riddled because ultimately it takes all jurisdiction out of municipalities' hands.

The hope is to get rid of the twenty-year franchise limitation, now statutory. Under the name "indeterminate franchise," the proposed plan has had a long try-out in Wisconsin and in Indiana. Under it the utility must not only establish public confidence, but it must keep that confidence. It is pointed out that there is nothing in the plan to prevent a permit from running 100 years.

Mayor Dever has launched a campaign to kill the Barr bill or amend it to make the city the judge of the "good behavior" condition on which the permits would be issued. To him has rallied most of the odds and ends of the crowd that beat the $500,000,000 transportation plan at the polls.

A duplicate of the Massachusetts public benefits law, offered in Illinois to permit subway building with subsequent fixing of public assessments, had hard sledding at a Senate hearing. Opponents said it robbed the public of any slim chance now held to protect itself against undesirable improvements, and finally the bill was tabled.

New York State Men Reject Pay Proposal

By a vote of 552 to 516, employees of the New York State Railways in the cities of Rochester, Syracuse and Utica turned down the proposal to renew the existing wage and labor contract with the company. Union men in Rochester voted against renewal 422 to 110. This offset the majorities for adoption in Syracuse and in Utica. Syracuse cast 209 votes for and 42 against. The Utica result was 197 to 88 for the pact renewal. Only 1,068 of the total membership of 3,000 in the three cities took part.

The existing schedule calls for a wage of 51 cents an hour for the first three months, 53 cents for more than three months up to a year and 55 cents for more than a year's service. Interurban operators receive 2 cents more an hour and operators of one-man cars 5 cents additional. The basic day is 9½ hours and the maximum limit for overtime is 75 cents an hour.

In the preliminary bargaining the union asked for a general 7-cent increase and certain revisions in working conditions. The company countered with a demand for a 5-cent cut. In conferences a compromise was effected along the lines of the present contract. This agreement was the one turned down by the workers.

The varying vote in the three cities is explained by the different classes of work. In Syracuse and Utica nearly all employees are of the one-man classification, receiving 60 cents an hour. In Rochester the two-man operators predominate. While Rochester employees generally protest against the universal adoption of the one-man car, they insist that the wage scale in the Kodak City be brought up to the standard in Utica and Syracuse. Arbitration will remove all possibilities of a strike. The present compact expired on May 1.

Employees of the Auburn & Syracuse Railroad have agreed to a continuation of the existing agreement, which includes a 50-cent an hour pay provision.

10 per Cent Wage Increase Sought in New Orleans

An advance in wages of approximately 10 per cent has been asked by the 3,000 employees of the New Orleans Public Service, Inc., affiliated with the Amalgamated Association. The two-year agreement entered into between the corporation and its employees last year left it discretionary with the contracting parties to reopen the negotiations at the expiration of twelve months. The wage scale effective under this agreement for motormen and conductors was 47 cents an hour for the first six months, 49 cents for the succeeding six months and 51 cents thereafter.

Third Atlanta Arbitrator Selected

Edwin F. Johnson, Fulton County Commissioner, has been selected as the third member of the arbitration board which is to consider a demand for wage increases made by the Amalgamated Association on the Georgia Railway & Power Company, Atlanta, Ga. The board, in addition to Mr. Johnson, is composed of C. M. Candler, arbitrator selected by the company, and Luther Still, member of the Atlanta Typographical Union, by the men.

The arbitration body is the same that officiated last year when wages were increased from 48 to 51 cents an hour. The new demand is for an increase from 51 to 60 cents an hour for motormen and conductors, with demands for proportionate increases for others.

Basic Wage in Philadelphia Is 77 Cents

A plan now being prepared by the Philadelphia Rapid Transit Company, Philadelphia, Pa., provides for a basic wage which would rise and fall in accordance with its purchasing power, plus an added wage to encourage greatest employee efficiency. This plan would in effect mean two wage scales—one providing for adequate living and saving in good times or in bad and the other providing the employee with a stake in the game and giving opportunity for improvement in his living conditions and those of his family. The actual wages of P. R. T. employees have departed so far from the war-time expedient of the three-city average that the company has long been seeking a more accurate measure.

Since 1922 the employees of the company have received a co-operative wage participation, not to exceed 10 per cent of the annual payroll, in return for the co-operative effort. Although the wage participation has always been a part of the wages of employees, the policy of making it payable only after the earning of the stockholders' dividend has created the impression, in spite of repeated denials, that it is a bonus rather than a wage. In order to settle this question finally, Mitten Management suggested that the 10 per cent added wage be included as an operating expense payable before instead of after fixed charges and dividends.

The general committee for employees has approved this procedure, and it will be made retroactive to Jan. 1, 1925. The basic wage of P. R. T. employees will thus become 77 cents an hour, 7 cents of which is in payment for added effort, to be turned over, as now, to the employee trustees for investment.

The company explains:

> P. R. T. trainmen's wages for several years after the incoming of Mitten Management in 1911 were based on an annual sum equal to 22 per cent of P. R. T. gross earnings, so that wages increased as the effort of the men made increased wages possible. In 1918 the abnormal conditions due to the war, and the desire to bring all departments into the co-operative plan, led to the adoption of a wage based on the average paid in four large cities—Chicago, Detroit, Cleveland and Buffalo, the latter being afterward dropped when Mitten Management took over operation of that property. The 10 per cent wage participation was added after P. R. T. employees had proved themselves much more effective than the employees in these other cities. The present wage is now effective for this year regardless of what happens in the three other cities.

Recent Bus Developments

Eastern Massachusetts Street Railway Retires from Boston-Lowell Service—Projects Reported from Many Quarters

After many complexities the Eastern Massachusetts Street Railway lost its fight with the Boston & Maine Railroad over the right to operate a bus line between Boston and Lowell. Its service was, therefore, discontinued Tuesday evening, May 5, after the company had permitted passengers to ride free several days to overcome a legal technicality.

The company had operated the buses for about eight months under a license in each city and town along the route. When the question of renewal of the licenses came up the Boston & Maine Railroad entered a protest in each place. The sharpest kind of a campaign was carried on by the contestants.

Cambridge proved to be the key to the situation. There the City Council voted unanimously to renew the license and the Eastern Massachusetts expected no further difficulty in that city, but Mayor Quinn refused to sign the license, and without his signature the grant was not valid. Consequently on May 1 the Eastern Massachusetts lost its right to operate these buses through Cambridge, for hire, but as a matter of strategy, to conserve its legal standing pending developments, the Board of Public Trustees decided to operate the buses free. The railway was guaranteed against loss during the period of free operation by one of its stockholders.

The San Diego Electric Railway, San Diego, Cal., has been authorized by the Railroad Commission to discontinue the operation of its motor coach line between National City and Chula Vista and to discontinue the operation of railway service over tracks of the San Diego & Arizona Railway between Twenty-fourth Street, National City, and Third Street, Chula Vista.

As the result of further hearing by Railroad Commission of the complaint of the city of Oakland against the Key System Transit Company, alleging inadequate local service, the commission has directed the company to make application to the proper municipal authorities for franchises, or permits, to extend the existing Montclair-Glenwood coach route to serve the district in the vicinity of Fortieth and Piedmont Avenues. This line was recently rerouted to start from the intersection of Piedmont and Pleasant Valley Avenues in the city of Oakland. The commission also directed the company to extend its Thirty-fifth Avenue coach line to Jordan Road during the morning and afternoon rush period, but during the remainder of the day to leave the terminus of the line at Thirty-fifth Avenue and Hopkins Street. Rerouting of the Foothill Boulevard and 82d Avenue coach line was ordered.

The New Orleans Public Service, Inc., New Orleans, La., has three lines of buses in operation as feeders to the railway in sections of the city not sufficiently populated to warrant railway lines. Ten single-deck buses are in use each with a seating capacity of from 25 to 28 passengers. Authority has been obtained from the Commission Council to establish lines on the Gentilly Road, the Canal Boulevard and Broad Street.

The City Council of Seattle, Wash., recently passed an ordinance authorizing the operation of buses on Empire Way by the Seattle Municipal Railway. An eleventh-hour effort to block the ordinance was made by the Seattle & Rainier Valley Railway in a communication in which it called attention to the fact that if the municipal bus service is started on Empire Way, it will reduce the volume of business of the railway and thereby increase its unit cost of hauling passengers, which at present is claimed to be almost equal to the unit gross revenue. The Council has denied the application of the Rainier Valley Railway to operate buses to the Seward Park district.

By means of a new motor route started by the Indianapolis & Cincinnati Traction Company direct shipping connections are established between Shelbyville, Ind., and the territory to the south, including Hope, Rugby, Hartsville and Millford.

A definite plan for establishment of six new bus lines in Cambridge by the Boston Elevated was disclosed recently by receipt of a petition for permits, together with application for renewals of those for the two bus lines already being operated in Cambridge.

Laconia Street Railway, Laconia, N. H., has purchased two 21-passenger Reo buses for transporting passengers to the Weirs. A single-track electric line of about 5 miles, formerly operated for this service, will be discontinued. This line will serve summer resorts on Lake Winnepesaukee. Buses will operate on an hourly schedule.

The bill of Assemblyman Hanson allowing electric railways to go into the bus business without forming subsidiary companies for this purpose has been passed by the New Jersey Legislature. The bill of Assemblyman Beardsley relieving corporations from the responsibility of taking out damage insurance for accidents to passengers while riding in their buses has also been passed.

An effort is being made by the motor interests of Massachusetts to have the new bus law placed on the ballot for a referendum vote at the next state election. The law which was enacted in Massachusetts by this year's Legislature, has been signed by the Governor. It requires a certificate of necessity and public convenience from the State Department of Public Utilities in order to operate a bus line and places the bus lines under substantially the same control as the electric railways. Its enactment was sought by the electric railways and the railroads to protect them against uncontrolled and unfair competition.

Mayor Ulrich Wiesendanger of Yonkers, N. Y., has further complicated the bus controversy there by announcing that he has decided to veto the ordinance passed by Yonkers Aldermen to give the permit for the sole operation of buses in Yonkers to the Westchester Bus Corporation. The Audubon Transportation Company, Yonkers, has been restrained from operating buses for three months on application of the Union Railway, subsidiary of the Third Avenue Railway.

Management of Toledo Road Offered to City

Henry L. Doherty has sent a letter to Mayor Brough of Toledo, Ohio, suggesting a fund of $2,000,000 be raised for needed improvements and extensions to the property of the Community Traction Company and offering to turn control of the road over to citizens of Toledo. He will take a block of $500,000 of preferred stock of the Community Traction Company, provided the citizens of Toledo subscribe for $1,500,000 of the same issue. The voting power would go to the purchasers of this block of preferred stock. At the meeting of the Council on the evening of May 4 the matter was turned over to the Board of Street Railway Control for study.

Mr. Doherty said that the "street railway property will never get the co-operation of the people of Toledo that it deserves until it is owned, or more substantially owned, either by the city itself or by the people of Toledo." He said:

> If we could enlist the active participation of the representative citizens of Toledo in a comprehensive transportation system we could command the best brains of all Toledo in business, financial and other lines in solving all of the problems as they arise that have to do with traffic.
>
> I have recommended, and the board has passed, proper resolutions authorizing the officers of the Cities Service Company to purchase an additional $500,000 of preferred stock in the Community Traction Company, providing a group of representative citizens will purchase an amount equal to what our then holdings will be, namely, $1,500,000, and the board has further authorized us to assign all of our right, title and interest, without further consideration, in the common stock of the Community Traction Company to this group of citizens, with the expectation of turning over to them the control and management of the company in the joint capacity of serving both the needs of the city and citizens and the needs of the company.

The original capitalization of the Community Traction Company provided for $8,000,000 of 6 per cent first mortgage bonds, $2,000,000 of 8 per cent preferred and $10,000,000 of common stock to be held in trust by sinking fund trustees of the city and issued to the city of Toledo upon redemption of the bonds or preferred stock through the operations of the sinking fund.

To date nearly $900,000 of bonds has been retired and a similar amount of common stock—the only outstanding—issued to the city.

The city has one member on the board of directors of the company.

Ten-Cent Fare Sought in Savannah

A petition has just been filed with the Georgia Public Service Commission by the Savannah Electric & Power Company for a 10-cent cash fare, five tickets for 35 cents, or a weekly pass, intended to be sold for $1.25. The company also proposes to sell 30 tickets for $1 to children under 12 years of age. The present rate in Savannah is 7 cents. The fare case will be heard May 19.

Electrification of Canadian Line Awaits Outcome of Experiments

The electrification of the Toronto Eastern Railway, Toronto, Ont., is being held in abeyance while experiments are being carried on with unit type cars which, if successful, would dispense with overhead equipment. R. A. C. Henry, director of the Bureau of Economies of the Canadian National Railways, informed the railway committee of the Canadian House of Commons that the experiments would probably be completed by the end of this year. To put the line into operation would probably involve an expenditure of $1,000,000.

Service-at-Cost Measure Approved in Missouri

Governor Baker of Missouri has signed the bill which enables municipalities of 100,000 population to enter into agreements with railways, bus companies or other common carriers for fares based on the actual cost of operation, subject to approval by the Missouri Public Service Commission. The measure was favored by the reorganization committee of the United Railways, St. Louis, and was indorsed by the Board of Estimate of St. Louis.

Eastern Massachusetts Wage Demands Being Heard

Demands made by the union upon the Eastern Massachusetts Street Railway, Boston, Mass., for higher wages and better working conditions have become the subject of conferences. The men are asking for an increase in wages from the present rate of 54 cents to 70 cents, as the basic rate, and a differential of 8 cents in favor of the one-man car operators. This is an increase of 3 cents in the differential and would make the men's pay 78 cents an hour for operating one-man cars. Items are being taken up in the order of importance, or their relationship to the whole agreement. Present conditions are to continue until a new agreement is reached, but the new terms will be retroactive to May 1, the date of expiration of the old agreement.

Bus Regulatory Bill Fails in Missouri

The Missouri Legislature has adjourned without having passed any legislation affecting bus lines operating in the State. The bill introduced by Senator McCawley was amended repeatedly in both the Senate and the House, but it failed to be approved on final conference between committees of both branches of the Legislature. In consequence the cities will continue to exercise control over buses operating on their streets, while there is practically no regulation of the numerous bus lines in the country districts. The Legislature does not meet again for two years, unless called into special session by Governor Baker.

Ten-Cent Fare in Poughkeepsie

The Public Service Commission of New York on April 30 issued an order providing for a maximum cash fare of 10 cents to be charged by the Poughkeepsie & Wappingers Falls Railway. The order contains a provision requiring the company to sell at various public places in Poughkeepsie and Wappingers Falls six tickets for 50 cents, good where a 10-cent cash fare is charged.

The order maintains present reduced school tickets and provides for round trip fare between Poughkeepsie and Wappingers Falls of 40 cents and a round trip fare between Poughkeepsie and Kingwood Park of 30 cents. Last November the commission issued an order fixing a straight 9-cent fare. The rates were never put into effect by the company, however. The new schedule will represent a reduction for the regular car riders over the 9-cent fare provided last fall. It is estimated the new schedule will add about $22,500 to the operating revenues during the year.

The new tariff will remain effective until May 1, 1926.

Another Recess Committee to Study Boston "L"

The effort to secure legislation extending the public control of the Boston Elevated Railway twenty years failed in the Massachusetts Legislature, and a resolve was passed instead creating another recess committee to study the affairs of the company and bring in a report next year. Public control and operation cannot be terminated before 1928, but it continues automatically beyond that year unless it is terminated by affirmative action in the Legislature.

Municipal Road After More Detroit Lines

Ross Schram, general manager of the municipal railway at Detroit, Mich., says the matter of taking over transportation service from the Detroit United Railway to certain points in the Detroit metropolitan zone is being considered by the Detroit Department of Street Railways. The points to which the city of Detroit would extend service include Dearborn on Michigan Avenue, Halfway on Gratiot Avenue and Bedford and possibly Farmington on Grand River Avenue.

The Detroit United Railway is understood to be favorably inclined toward relinquishing its limited interurban service on Michigan Avenue east of Dearborn. The late president of the railway publicly expressed a desire shortly before his death that the municipal railway service be extended to Dearborn.

News Notes

Veterans' Club at Baltimore Celebrates.—The Twenty-five Year Club of the United Railways, Baltimore, Md., held its second annual banquet on April 30 at the Hotel Emerson. The club has a membership of almost 300. Several members have been in the employ of the United more than 50 years. William H. Staub, purchasing agent for the company, was elected president. He succeeds A. J. Dietz.

Sunday Rates During April.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, sold during April on Sundays round-trip tickets to any point on its line, far or near, for $1. For instance, the round trip from Waverly to Cedar Rapids costs $5.62 at regular fare, but on Sundays the cost was only $1.

Governor Signs One-Man Car Bill.—Governor Peay of Tennessee recently signed a bill which prohibits the operation of one-man cars in the larger cities of the state after Oct. 16, 1925.

Tells Public Railway Problems.—The Savannah Electric & Power Company, Savannah, Ga., in a series of advertisements in the *Morning News* is calling the attention of the public to all angles of local transportation so as to acquaint the people of the city and surrounding territories with the problems of the railway and impress them with the need for public co-operation.

President T. N. McCarter Makes Radio Address.—The radio was used to maintain the "personal touch" between workers and executives in big industrial enterprises recently when President Thomas N. McCarter of the Public Service Corporation of New Jersey enlisted the services of WAAM, Newark, to greet the 20,000 employees of the corporation. The latter part of April Mr. McCarter returned from the first long vacation that he has taken since he was instrumental in organizing Public Service, back in 1903. He wanted to thank the employees for their loyalty and faithful service, point out to them plans for the future and present to them some of the problems of the business.

Grade Warnings Discussed.—Representatives of many steam and electric railroads and of railroad signal manufacturing companies were present at a hearing before the Public Service Commission on April 16 on an order directing the railways to show cause why a standard form of automatic grade crossing warning should not be adopted. Under the present practice several types of automatic warning signals are installed.

Opposes Extension.—The New Brunswick Power Company, St. John, N. B., is opposing the demand made by real estate owners of Little River for an extension of the railway. Consideration of the plea of the property holders that the company be forced to extend the line has been deferred until May 27 by the New Brunswick Board of Public Utilities. The company says the expenditure is unwarranted.

Weekly Tickets Still in Force.—The Worcester Consolidated Street Railway has decided to continue the sale of weekly pass tickets in Leominster, Mass., for unlimited riding another month.

Surface Line Advertises for Business.—The New York Railways Corporation, New York, N. Y., which on May 1 succeeded the New York Railways, at once began a campaign to divert traffic from the subway and elevated lines to its own cars. Windows of closed cars bore large placards in green type, reading: "Green lines save walking, waiting, stair-climbing. Ride in comfort." Signs inside the cars advised passengers that the "green cars" were preferable to the subway for trips of 50 blocks or less. Open cars bore similar placards, and in addition signs in front read "Ride in the open."

One-Man Cars for Des Moines.—One-man cars are soon to be tried by the Des Moines City Railway, Des Moines, Iowa. Definite surveys to determine the practicability of the plan are now being carried out with a view to the use of the cars on outlying lines. Collectors would be stationed at the crowded downtown corners during the rush hours to allow loading at both ends of the cars. The new plan will not be put in operation on any lines unless the service which is now rendered can be fully maintained or made more efficient.

Union Demands Inclusion of Bus Operators. — Representatives of the trainmen employed by the Northern Ohio Traction & Light Company, Akron, Ohio, demand that 102 Akron bus operators employed by the company be included in the working agreement between the company and the union.

Transit Bill Before Governor.—The Pennsylvania House of Representatives recently concurred in the amendments made by the Senate to the Little bill creating a Department of City Transit in Pittsburgh and Scranton. The Senate amendments made the creation of a department of this kind optional instead of mandatory with the councils of the two cities. Other amendments would make the appointment of five members by the Mayor subject to the approval of Council. The commission is given power to enforce laws of the state and city ordinances pertaining to transit facilities. The measure was sent to the Governor.

Cross Seats Will Be Abolished.—The Connecticut Company, Bridgeport, Conn., will gradually abolish the old style cross seat open car, according to Manager Potter. Cars of this type will be used only in an emergency.

Wants to Know About Men. — The Louisville Railway, Louisville, Ky., in a recent "ad" in a local paper solicits information about its employees. The company wants to know when one of its number performs any unusually polite or accommodating act in order that proper recognition may be given. If there are occasions when the platform men forget their instructions and are guilty of actions which are inconsistent with the service aims of the company, such definite facts are welcomed in order that corrective measures can be taken.

Elevated Platforms to Be Extended.—The directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., have approved an expenditure of $125,000 to extend the platforms at sixteen stations on the Fulton Street "L" so that seven-car trains may be operated in the rush hours instead of six-car trains as at present. Not long ago the New York Transit Commission directed the lengthening of all of the stations on the main line of the Fourth Avenue subway in Brooklyn. This would make possible the use of eight-car trains instead of seven-car trains.

May Operate Buses Without Certificates in Michigan.—Electric railways need not secure certificates from the Public Utilities Commission of Michigan in order to operate motor vehicles supplemental to or as substitutes for present service, according to a bill passed by the Legislature. In all other respects such operation is subject to the same regulation as independently operated vehicles. The consent of local authorities must be secured for local operation. The vehicles must be operated under the commission's regulations regarding equipment, speed, etc.

Foreign News

One-Day Strike in Paris

Transport employees at Paris, who ceased work on May 5 in some sections of the city decided to resume work on May 6. The strikers were informed by their delegates that the company had agreed to reinstate, without exception or punishment, all the men who quit their jobs on May Day. The 200 men who were under suspension are to receive pay for the two days they were laid off. The strike movement had extended on May 5 until more than half the employees of the street car and bus services were out. Carhouses and power houses were guarded by troops and a policeman was stationed on each car that operated, but no violence was reported.

British Municipalities and Buses

In pursuance of the movement of the Municipal Tramways Association to obtain fairer terms for running buses, as compared with those applying to bus companies, representatives of the association had an interview on April 1 with about a hundred members of Parliament and stated their grievances and desires, as had been set out at the conference held the preceding week. The leading statement was made by A. R. Fearnley, general manager of Sheffield Corporation Tramways. His conclusion was that where municipalities possess the necessary Parliamentary powers to operate tramways or railless trolley vehicles they should be allowed to operate buses where they think advisable, and in this respect have equal facilities with companies, and that where licenses to run buses are refused appeal should be to the High Court instead of to the Ministry of Transport. The views of the deputation appeared to receive sympathy from the members of Parliament and it was arranged to seek an interview with the Minister of Transport on the subject.

Paris to Extend Its Subway System

The French Senate has passed a bill authorizing the city of Paris to float a bond issue of 500,000,000 francs to provide funds to extend the subway system. The Senate reduced this bond issue from a figure of 620,000,000 francs voted last year by the Chamber. The funds will permit the following work to be done:

1. Extension of line 7 (Pré St. Gervais-Palais Royal) to the Choisy gate of the city.
2. Completion of line 10 (Invalides-Odéon) to the Bastille.
3. Prolongation of line 8 (Auteuil-Opéra) under the Grande Boulevards and the Boulevard Beumarchais to the Bastille.
4. Prolongation of line 9 (St. Cloud-Chaussée d'Antin) to the Picpus gate. This line, which will pass underneath the extension to the Boulevard Haussmann now under construction, will follow along line 8 to the Place de la République.

Owing to the failure of the Senate to authorize the full amount of 620,000,000 francs, the construction of lines 11 and 12 will have to be postponed. These lines as proposed were:

11, Porte des Lilas-Hôtel de Ville.
12, Porte d'Orléans-Porte de Gentilly.

A sum of 140,000,000 francs is now owed to the Metropolitan Subway Company and will be a first charge on the funds from the proposed bond issue of 500,000,000 francs.

Fare Reductions on London Underground. — The London Underground railway companies, wishing the public to use the railways rather than the buses for the longer distances, on April 1 put a reduction of fares into effect on many routes. In general 7d. fares were reduced to 6d., and higher fares for longer distances were reduced proportionately.

Barrow Changes to Railless. — A House of Commons committee has passed proposals in a bill promoted by the Barrow-in-Furness Corporation to authorize the conversion of the municipal tramways to railless electric traction, and the running of buses within the borough and on two routes outside.

Glasgow Fixes Maximum Fare from City Center.—The tramways committee of Glasgow Corporation has approved a recommendation to fix a maximum fare of 2d. for the conveyance of passengers to and from the center of the city. By the introduction of this fare it is expected that a way will be found to meet the keen competition from bus services in neighboring districts.

Receipts Higher.—In spite of the unfavorable weather of 1924 the receipts of the Brighton Corporation Tramways for the past twelve months show an increase of nearly £2,400 on the returns for the previous year.

Financial and Corporate

Chicago "L" Does Well

Income Before Dividends $801,375—More than 5,000 Employees Are Stockholders

Combined operating and non-operating revenue of the Chicago Rapid Transit Company, Chicago, Ill., for 1924 was $18,775,933. The total expenses, including taxes and retirement reserve, were $15,167,109. From the balance, $3,608,823, there was deducted for interest, rentals and amortization of discount $2,807,448, leaving as net income the sum of $801,375. Out of this net income dividends of $74,733 were declared and paid on the company's outstanding prior preferred stock, leaving $726,642 as unappropriated surplus earnings for the year, no interest having been declared or paid on the company's adjustment debenture bonds. To this surplus other credits of $232,030 were added, making a total surplus at the end of the year of $958,672. The expenses charged for the year include $239,608 credited to the retirement reserve account.

INCOME STATEMENT OF THE CHICAGO RAPID TRANSIT COMPANY
For the Year Ended Dec. 31, 1924

Passenger revenue		$17,504,220
Other transportation revenue		1,060,964
Gross operating revenue		$18,565,185
Operating Expenses:		
Maintenance of way and structures	$1,993,174	
Maintenance of car equipment	1,543,974	
Power	1,988,769	
Conducting transportation	7,036,998	
General and miscellaneous	1,196,735	
Total operating expenses		*13,759,650
Net operating revenue		$4,805,535
Taxes, city compensation, etc		1,407,459
Operating income		$3,398,075
Non-operating income		210,747
Gross income		$3,608,823
Deductions:		
Rentals	$467,714	
Interest on mortgage debt and equipment obligations	2,244,167	
Interest, other	69,610†	
Amortization of discount	25,955	
Total		$2,807,448
Net income		$801,375
Dividends paid on prior preferred stock		74,733
Surplus earnings for the year unappropriated		$726,642
Other profit and loss credits carried to surplus		232,030
Balance surplus unappropriated, Dec. 31, 1924		$958,672

* Total operating expenses include $239,608 credited to retirement reserve.
† No interest declared or paid on adjustment debenture bonds.

During the year the lines carried 212,901,024 revenue passengers, considerably more than had been carried by the combined lines at any time in their history. In the month of December 19,460,549 revenue passengers were carried. This established a new high monthly record. For the year the average fare per passenger was approximately 8¼ cents.

On May 6, 1924, pursuant to authority given at a special meeting of the stockholders, the company's authorized capital stock was increased from $21,000,000 (all of one class) to $25,330,500, classified as follows: $5,000,000 prior preferred stock, $1,000 preferred stock and $20,329,500 common stock. In addition to the securities issued in January in connection with the acquisition of its properties the company during the year sold $9,000,000 principal amount of its first and refunding bonds, 6½ per cent series due 1944, and $4,363,300 par value of its prior preferred stock, series A, carrying dividends at the rate of 7.8 per cent per annum, payable monthly. Of the stock so sold $2,761,500 face amount was issued and paid for in full during the year. The remainder was sold on the installment plan and at the end of the year had not been fully paid for and had not actually been issued.

A portion of the proceeds of the sale of the bonds and stock was used (a) to retire $8,000,000 principal amount of first mortgage bonds of South Side Elevated Railroad which matured on July 1, 1924, and (b) to purchase $2,500,000 principal amount of first mortgage 5 per cent bonds of the Lake Street Elevated Railroad maturing on July 1, 1928, which bonds upon their acquisition were pledged under the first and refunding mortgage of the Chicago Rapid Transit Company. The rest of the proceeds will be used to pay for new cars and contemplated extensions and improvements. On Feb. 1, 1925, the entire authorized $5,000,000 of prior preferred stock, series A, had been sold. Of this total $1,348,900 par value was sold to 5,334 employees and members of their families.

Experts at Work on Detroit United Property

A letter to stockholders of the Detroit United Railway, Detroit, Mich., sent out by A. E. Peters, secretary, on April 28 states simply that plans are still under consideration and will be announced later.

Stockholders were advised by a circular letter dated March 10, last, that the company directors had under consideration a plan by which the necessary funds might be obtained to enable the owners to resume complete control of the property.

Before giving further consideration to this plan, it has been deemed advisable to ask an audit of the books and accounts of the company as to the date of the receivership.

It was also deemed advisable, the April letter states, to obtain a report from independent experts on operating and traffic conditions and possibilities, and on the financial commitments and probable capital expenditures required. As noted previously in the ELECTRIC RAILWAY JOURNAL, A. L. Drum & Company, Chicago, have been engaged for this purpose, and their preliminary report has just been received.

Indiana Interurban Inspected—Insulls Reported Interested

A committee representing bondholders of the Union Traction Company, Anderson, Ind., accompanied by several officials of the company, recently inspected the interurban lines. The committee, it is understood, will submit a report to the bondholders containing recommendations concerning action to protect their interests. Although it is denied that the question of the sale of the company is considered at this time, it has been rumored in utility circles that the Insull interests, operating the Interstate Public Service Company and other traction lines in Indiana, may eventually acquire the property.

Arthur W. Brady, receiver and president of the Union Traction Company, said the inspection had no relation to rumors that representatives of the Insull interests might bid for the property at receiver's sale. No court order for such sale has been asked. The receiver operates under the direction of the Madison Circuit Court.

$4,208,577 Reduction in New Orleans Rate Base

The rate base of the railway division of the New Orleans Public Service, Inc., New Orleans, La., was reduced in the sum of $4,208,577 by the assignment of this amount to the electric division of the corporation, in the adoption of the ordinance introduced by Commissioner Paul H. Maloney of the Department of Public Utilities. This was one of the last acts of the expiring Commission Council, the members of which went out of office on April 30.

Mayor McShane alone dissented in the vote of adoption. In a written statement, he said in part:

> While the original rate base of the corporation was settled upon Dec. 31, 1920, at $44,700,000 after more than fifteen months of investigation and discussion, this ordinance virtually indorses and establishes a new rate base at a much higher figure without any investigation.

He pointed out that under the new electrical department rate base it will be difficult to obtain a reduction in electric power rates.

Tort Creditors Treated Liberally

Under an agreement between the reorganization committee of the New York Railways, New York, N. Y., and the committee representing creditors from accident damages, worked out under the supervision of the commission, the creditors have two options of payment. Under one option they may receive two-thirds of the amount of their claims in cash or be permitted to accept in lieu of the cash payment 100 per cent of their approved claims in prior lien mortgage 6 per cent gold bonds, series A, an issue of which in the amount of $3,800,000 has been approved by the commission, under a general prior lien mortgage.

Another prerequisite to the reorganization which the commission regarded as of foremost importance and which it insisted upon, though without legal power to impose it upon the new company, was the inclusion of a provision calling for the naming of public directors, nominated by the commission to the board of the new company. In the case of the B.-M. T. and Interborough reorganizations, because of the financial interest of the city under the dual contracts, the commission was in a position to insist upon the inclusion of public directors. In the case of the New York Railways Corporation, however, the reorganization committee agreed to the commission's suggestion and the commission has already nominated Samuel L. Martin and George Billings Gibbons as public directors.

The commission further insisted that ample provision be made for the amortization of discount on bonds within a period of fifteen years, a step regarded by the commission as in the direction of sound and scientific financing. This provision was also accepted by the reorganization committee on behalf of the new company.

Opinion on Stock of No Par Value in Indiana

Arthur L. Gilliom, Indiana Attorney-General, has submitted an opinion to Samuel R. Artman, chairman of the Public Service Commission, with respect to authorizing a public utility corporation to issue no par value common stock. Mr. Gilliom says that the commission in determining the value of the stock as the basis for assessing fees should consider evidence submitted by the utility corporation on this point, the books and records of the company and any other information that would indicate the value of the stock.

Mr. Gilliom said that the provisions of the Indiana law, which in certain contingencies places a value of $10 a share on no par value common stock, apply only for the purpose of determining the ratio of common stock that may be authorized to other authorized capital issues, but does not apply to the valuation of no par common stock as a basis of charging fees.

Mr Gilliom said that the commission is warranted in having the utility itself say what value it places on the stock. He said if evidence can be found in the books and records of such value this value should be taken. The burden of establishing the value of the no par common stock is on the utility, Mr. Gilliom said, and the commission is not bound to accept the valuation in the absence of supporting evidence.

A utility corporation, in appealing such a case, Mr. Gilliom said, could not show a clear legal duty of the commission to accept the value of the stock contended for if the utility had not provided the necessary information to justify such a finding being made by the commission.

Mr. Gilliom pointed out that there is no general rule to determine such value which would serve as a guide in all cases. He indicated, however, that in the instance of a merger where no par value common stock is exchanged for common stock of a determined value, the latter value would serve to indicate the value that might be asumed as a basis of charging fees of the no par value stock issue.

Remarkable Improvement in Earnings in Boston

Edward Dana, general manager of the Boston Elevated Railway, Boston, Mass., on April 28 made public the detailed statement covering the operations of the system for February. The improvement made over the similar month a year ago is so marked that some of the principal statistics of operation are presented in the accompanying statement.

RESULTS OF OPERATION OF BOSTON ELEVATED RAILWAY IN FEBRUARY

	1925	1924
Revenue exceeded cost of service	$118,183	$19,247
Ratio operating expense to operating revenue, per cent	67.36	72.23
Operating revenue per car-mile operated, cents	64.96	64.10
Operating revenue per car-hour (A. E. R. A. standard)	$6.21	$6.06
Revenue passengers	29,826,343	32,525,051
Per cent 5-cent and 6-cent fare passengers	19.21	27.02
Average fare per revenue passenger, cents	9.200	8.649
Revenue passengers per car-mile operated	6.927	7.263
Car-miles operated	4,305,828	4,477,538
Trips operated	547,447	531,925
Direct-current kilowatt-hour output gross for month	22,474,915	27,475,975
Maximum kilowatt-hour load	84,580	84,650
Tons of coal consumed	20,130	26,627

Similarly, receipts of the Boston Elevated Railway for March were in excess of the cost of service. The March amount was $211,955. This brings the reserve fund up to $776,656, with $223,444 yet to be added before the required $1,000,000 can be reached.

Last November the reserve fund was $1,042,000 below the zero mark, while now it is more than $776,000 on the right side of the ledger. Among the economies effected was a reduction in the force of employees. This actually left the payroll the same as it was last year for nine months in spite of the increase in wages granted by the arbitration board.

Commission and Company Join Issue Against City of St. Paul

The State Supreme Court has under advisement the appeal of the Minnesota Railroad and Warehouse Commission and the St. Paul City Railway on an order to show cause why the commission should not file with the Ramsey County District Court the findings in an appraisal of $15,998,000 value for the company's property. This is part of a proceeding to determine a permanent rate of fare in St. Paul. The order was issued on March 9 by Judge R. D. O'Brien of the lower court and was made returnable on April 30.

The point at issue is whether the case is appealable. The commission contends that the proposed findings of the valuation of the St. Paul City Railway have not been signed by any member of the commission and no rate order has been issued. The Brooks-Coleman act, which places rate making with the commission, provides for appeal to the courts, but the commission has not yet made any appealable order, ruling or decision.

When the commission announced the tentative finding of valuation the city of St. Paul appealed to the District Court and the order was issued to file the findings with the court. This the commission refused to do. It was argued that a proceeding of this kind would throw the power of rate making into the courts, a contingency not contemplated under the terms of the act. The railway joined in the case.

Purchase Price at Seattle Held to Be Too Low

In further negotiations between the city of Seattle, Wash., and the Seattle & Rainier Valley Railway, looking toward the purchase of the railway by the city, Walter M. Brown, general manager of the company, pointed out further discrepancies in the city's appraisal of $1,045,547 for the lines. He declares this figure is low, but has not submitted a sum which his company believes equitable for the purchase of the lines. Mr. Brown declared that the figure for the company's tracks is $57,486 under their real valuation. City experts put the value of the company's tracks at $633,513.

Railway Earnings in Evansville Lower

The railway department of the Southern Indiana Gas & Electric Company, Evansville, Ind., was affected during 1924 to some extent by the unsettled business conditions during the summer in the Evansville territory. This fact was disclosed in the annual report to the stockholders. General operating results, however, were very satisfactory. Revenue passengers carried totaled 12,931,255 in 1924, against 13,935,605 in 1923.

SOUTHERN INDIANA GAS & ELECTRIC COMPANY

Gross earnings:	1924	1923
Electric	$1,214,619	$1,100,778
Railway	871,839	936,583
Gas	507,108	486,906
Steam heating	61,046	54,495
Total	$2,654,614	$2,578,764
Operating expenses and taxes	1,630,064	1,626,932
Gross income	$1,024,550	$951,831
Interest and other fixed charges	438,530	433,418
Net income available for dividends and depreciation	$586,020	$518,413
	Per Cent	Per Cent
Ratio of operating expenses to gross earnings	52.06	54.71
Ratio of operating expenses and taxes to gross earnings	61.40	63.09

SUMMARY OF SURPLUS ACCOUNT

Balance—Jan. 1, 1924		$434,854
Net income available for depreciation and dividends—Year ended Dec. 31, 1924 (as above)	$586,020	
Deduct—Provision for depreciation	207,000	379,020
		$813,874
Deduct—Sundry direct surplus charges (net)		17,589
Balance		$796,285
Less—Dividends:		
On 6 per cent cumulative preferred stock	$131,526	
On 7 per cent cumulative preferred stock	86,010	
On common stock	120,000	337,536
Surplus—Dec. 31, 1924 per balance sheet		$458,749

The railway property embraces more than 70 miles measured as single track, 38 miles being the city system in Evansville and the remainder an interurban line extending north from Evansville to Princeton and Patoka. The equipment includes sufficient rolling stock, carhouses and shop capacity for city and interurban service.

Receiver Appointed for Indianapolis & Cincinnati Traction

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., has been named receiver for the company by the Circuit Judge at Rushville. His bond is fixed at $25,000. The company has been in financial difficulties for some time, and, according to Mr. Henry, the action was necessary to protect the creditors and conserve the assets. The company operates about 100 miles of electric railway in Indiana, one line running between Indianapolis and Connersville and the other between Indianapolis and Greensburg. Increased operating costs following the close of the war and decreased earnings due to business conditions and bus competition are given as reasons for the condition of the company.

Duluth-Superior Company Does Better

The Duluth-Superior Traction Company, Duluth, Minn., has gone in for employee-customer stock ownership, having recently placed $500,000 of 7 per cent preferred at 98. The company will use the funds to retire a similar amount of outstanding bonds.

Following the valuation of Duluth's property by the commission the company was permitted to collect a 6-cent fare, but had to surrender its franchise, expiring in 1931, for an indeterminate one. Under this arrangement operations have been profitable, and it is expected the common shares will be put on a 4 per cent dividend basis in July next.

Gross earnings for March were $166,934, an increase of $15,709 over the corresponding period of 1924. For the first quarter of the year gross earnings are up 9.2 per cent. Following is a comparison of earnings for the month of March and for the first quarter with those of the corresponding periods a year ago:

	1925	1924
March	$166,934	$151,225
First three months	502,629	460,360

Loss Reported on Railway at Athens.—The total revenue of the Athens Railway & Electric Company, Athens, Ga., for the year ended Dec. 31, 1924, was $403,682, while total expenses were $283,956. Net earnings, derived after operating expenses, taxes and rentals, were $119,725. A loss of $8,770 from the operation of the railway is shown in the report. The total revenue that was received from the railway for the year was $79,120, while total expenses were $87,891.

Hearing Held on Abandonment Petition.—Figures in support of their contention that the Anderson-Middletown branch of the Union Traction Company has been operated at a loss for several years were presented to the Indiana Public Service Commission on April 28 by officers of the company. The company wants to abandon the branch. The commission took the petition under advisement. No patrons of the line appeared at the hearing.

Seeks Partial Abandonment.—Abandonment and track removal is being sought by the Milwaukee Electric Railway & Light Company of a part of its Oakland Avenue line in favor of bus service. The company offers to operate bus service on a 30-minute schedule, replacing the present 45-minute schedule with no change in the present rate of fares.

Profit in March in St. Louis.—For the first time since November, 1924, the United Railways, St. Louis, Mo., for March shows a net profit in its operations. The gross operating revenues were $1,626,795 and non-operating income $21,044, a total gross income $1,647,839. Operating expenses, taxes, interest and miscellaneous charges were $1,626,295, leaving a net balance or profit of $21,544 for March. In October, 1924, the company's profit was $51,540 and for November, 1924, $14,011. December, 1924, and January, and February of this year all showed deficits. Col. Albert T. Perkins, general manager, said drastic economies had enabled the company to offset the large losses in revenue due to the competition of buses and private automobiles. The quarterly report for the period ended March 31 showed a decrease of 5,249,304 cash fares, compared with a similar period in 1924. For the last quarter 64,417,098 cash passengers were handled, compared with 69,666,402 in a similar quarter in 1924 and 66,344,240 fares for the quarter ended Dec. 31, 1924.

New Chicago Railway Directors.—At the annual meeting of depositories of capital stock of the Chicago Railways, Stanley Field, John W. O'Leary and C. J. Whipple were elected directors to succeed Bruce Borland, John E. Wilkie and J. M. Roach.

Par Value of Cities Service Reduced.—Stockholders of the Cities Service Company, New York, N. Y., have approved a change in the company's common capital stock by reducing the par value of the shares from $100 to $20 a share each. As a result of this change the directors intend to issue five shares of the new $20 par value stock for one share of the $100 par value stock now outstanding. At the same time the Cities Service Bankers' shares in denomination of $10 are exchangeable two for one of the new $20 par value common stock. The change in the par value of the stock has not affected the outstanding common stock capital of the company, which is approximately $71,000,000.

Book Reviews

Atlanta Local Transportation

Report to the City of Atlanta, Ga., on a plan for local transportation. By John A. Beeler. Published by the Beeler Organization, 52 Vanderbilt Avenue, New York City.

For permanent record the complete report on the local transportation situation in Atlanta has been published in book form. This report was abstracted quite fully in ELECTRIC RAILWAY JOURNAL for Jan. 10, page 55; Jan. 24, page 136, and Jan. 31, page 181. The bound volume includes the complete report with maps and charts, except for a mass of underlying data of local interest only.

Publicity—Some of the Things It Is and Is Not

By Ivy L. Lee. Published by Industries Publishing Company, 80 Lafayette Street, New York. 64 pages, $1.

Two addresses made by Ivy L. Lee are reprinted in this little volume. One of them was made before the American Association of Teachers of Journalism at Chicago on Dec. 30, 1924. The other was made before the annual convention of the American Electric Railway Association in October, 1916. The speech of 1916 attracted a great deal of attention. The points which were made in it are no less applicable now than they were then. The subject "Publicity as Applied to Public Service Corporations" is, in fact, even more pertinent now. Mr. Lee has a wealth of personal experience from which to draw, and those who have sought, consciously or unconsciously, to apply some of the advice he gave in 1916 can now measure the results in the light of their own experience. Some of the questions answered are: What is the difference between news and advertising? What is publicity? and What is propaganda—proper and improper? The volume may well be read and reread. It is really a desk book, both for the man who thinks he knows and for the man who knows not and knows that he knows not—a *rara avis* where publicity is concerned.

E M F Electrical Year Book for 1925

Edited by Frank H. Bernhard and a staff of contributing editors. 1,397 pages, 9x12, illustrated. Published by Electrical Trade Publishing Company, Chicago, Ill.

This is the fourth edition of the now well-known E M F Electrical Year Book, whose purpose is stated as "a complete classified directory of all electrical and related products, their manufacturers and trade names, with informative definitions of each class of products and catalog exhibits of the leading manufacturers." This year there has been a revision to prevent the book from becoming unwieldy. Articles of general interest and Canadian listings have been dropped, which have helped to keep the book within reasonable proportions. The encyclopedic classification is followed, so that electric railway topics are scattered throughout the book in alphabetical order.

Personal Items

Messrs. Roberts and Fisk Consultants

General Manager for Receiver of Roads on Long Island and a Beeler Staff Man to Engage in Business for Themselves—Both Men of Wide Practical Training

TWO men well known in the utility field have joined forces to engage in consulting engineering work on transportation, traffic and power. They are E. A. Roberts and I. W. Fisk. Mr. Roberts is at present general manager for the receiver of the New York & Queens County Railway, the Long Island Electric Railway and the New York & Long Island Traction Company. Mr. Fisk has recently been with the Beeler organization. The new firm will have the corporate title of Fisk & Roberts. The New York office will be at 82 Beaver Street, which is in the downtown financial district.

With the railways on Long Island Mr. Roberts has rounded out in a responsible operating post experience that previously had been almost totally engineering in character and scientific and economic in its aspects. It furnished just the opportunity that he desired, did this work on the Long Island roads. Moreover, he knows better than ever before where practice and theory are likely to part company, but best of all it has been possible for him to confirm for himself the fact that the line of demarcation between scientific theory and the practical application of that theory is not so sharply drawn as the apostles of the rule-of-thumb school are inclined to believe. The consultant who has found these things out for himself is indeed in a position well nigh impregnable.

After all, Mr. Roberts' work on Long Island is only another addition to his long list of accomplishments. He has been general manager of the New York & Queens County Railway since Jan. 18, 1923; general manager of the New York & Long Island Traction Company since Feb. 3, 1924, and general manager of the Long Island Electric Railway since Nov. 1, 1924. Everything is relative, and the work of Mr. Roberts has to be viewed with the picture uppermost in the mind of the former state of decrepitude of these roads. In the light of their present condition, it seems indeed unkind even to refer to the matter. There certainly are times when it is advisable to let well enough alone. This appears to be one of those occasions.

E. A. Roberts

Mr. Roberts formerly was chief of the transit bureau of the New York Transit Commission. Before that he had been assistant to John A. Beeler. consulting traffic expert, and during his connection with Mr. Beeler did intensive work in the supervising of electric railway operations. After he joined the Beeler organization in 1917 Mr. Roberts served with the Massachusetts Public Service Commission in the investigation of operating methods and practices preceding state control of the Boston Elevated Railway, and with the Public Utilities Commission of the District of Columbia. His work there was to increase the capacity of the Washington railway systems under war conditions. He also made extensive investigations for the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey.

After he was graduated from Harvard College in 1914 Mr. Roberts spent two years with the General Electric Company at Lynn, Mass., and Erie, Pa., in departments connected with the manufacture of electric railway apparatus. During 1916-17 he was a research member of the faculty of the railway engineering department of the University of Illinois, and for a short time thereafter he was associated with the Boston Elevated Railway in its electrical engineering department.

Mr. Fisk's experience in the electric railway industry covers the fields of financial and operating investigations of traffic and power conditions, as well as appraisal work, in Philadelphia, Kansas City, St. Louis, Syracuse, Des Moines, Wichita, Topeka, Danville, Champaign, Urbana, Colorado Springs, Galesburg and Jacksonville. He was graduated from the University of Illinois, department of electrical engineering, in 1909, was a member of the engineering faculty from 1909 to 1918 and was assistant professor during 1917 and 1918. During this period Mr. Fisk was consulting engineer for many corporations and municipalities in the Middle West and consulting engineer for the Champaign-Urbana Water Company in 1916, 1917 and 1918. In the fall of 1918 he took charge of the engineering school at the Drexel Institute of Technology, Philadelphia, Pa., and organized and directed the Student Army Training Corps at that institution.

In the spring of 1919 Mr. Fisk joined the Beeler organization, with which he has since been associated with the exception of one and a half years as general manager of the water, light and power properties at Springfield, Ill. During this period these light and power properties were rehabilitated and enlarged and a complete electrical distribution system for the city constructed. Mr. Fisk introduced many operating economies in the plant, making material reductions in the cost of energy.

I. W. Fisk

H. P. Bell Made Chief Engineer Key System

H. P. Bell, appointed chief engineer of the Key System Transit Company, effective on April 6, has been closely identified with electric railway work since 1907. He received his early experience with the Utica & Mohawk Valley Railway, the Utica city lines and Syracuse city lines, now included in the system of the New York State Railways. Mr. Bell was also active in the electrification of the West Shore Railroad between Utica and Syracuse, N. Y., then known as the Oneida Railway.

In October, 1910, he became connected with the Oakland Traction Company, Oakland, Cal., as an electrical test man. As the Key System Transit Company absorbed the Oakland Traction Company in a general merger of eleven different properties, Mr. Bell systematically earned promotions from test man to foreman, to supervisor, to assistant engineer, to electrical engineer and now to chief engineer in full charge of all engineering matters of the consolidated properties, with headquarters in Oakland.

Mr. Bell was born in Trinidad, Cal., on April 23, 1885, and received his early education in the public schools of California. Later he attended Leland Stanford University, Berkeley, Cal.; Syracuse University, Syracuse, N. Y., and Cornell University, Ithaca, N. Y. At the latter institution he specialized in electric railway and power work.

He is a member of the American Electric Railway Association, American Institute of Electrical Engineers, American Society for Testing Materials and the Pacific Railway Club.

H. R. Stamm Leaves Industry

Architect of the Connecticut Company Goes Into Consulting Work in New Haven

H. R. Stamm has resigned as architect of the Connecticut Company, New Haven, Conn., to become connected with W. R. Foote, New Haven, one of the best known architects in the State. In many respects Mr. Stamm is no less an engineer than he is an architect, but his leanings are more toward architecture than they are toward engineering. He has served the Connecticut Company acceptably through two terms of employment, but feels that he will, perhaps, be afforded a wider scope for his talents in the purely architectural field than would be possible under conditions in which architecture and engineering must necessarily be combined, as is the case in railway and industrial work.

Mr. Stamm is a technician in the fullest sense of that word. He was born in Basel, Switzerland, in 1884. He attended the local schools there and was graduated in 1907 from the technical college at Bern with the degree of engineer of building construction. Not satisfied with these honors he studied architecture at the University of Stuttgart for two years and took the final examinations in both architecture and art.

His professional career began in 1910. Mr. Stamm served first with the architects for the French government and then went into business with his father, an architect in Basel. In May, 1914, he came to the United States. Here he worked first for the Austin Company at Bridgeport. In 1915 he went with the Connecticut Company as a draftsman and remained with the company three years. Meanwhile he took up ship construction work in his spare time and then entered that field with the Ship Construction & Trading Company at Stonington, Conn. During the war-time period he served with several ship and engine concerns, principally near New London. In 1921 he returned to Switzerland for a visit which was protracted for nine months. Part of this time was consumed on a mission for the Chamber of Commerce for the city of New London which had for its purpose a project for arranging a commercial steamer line to ply from Hamburg to New London and thence to Columbia, South America. This project involved an interview by Mr. Stamm with the late Hugo Stinnes. It failed to materialize only because the city of New London found it impossible to meet the conditions which Mr. Stinnes regarded as essential to the success of the undertaking.

DESIGNED MANY NOTABLE STRUCTURES

On his return to the United States Mr. Stamm re-entered the service of the Connecticut Company. During this period of his service he has designed a number of notable structures for the company, among them the Grand Avenue garage in New Haven at a cost of $120,000, a modern paint shop at Waterbury at a cost of $57,000 and a new carhouse and operating building at Waterbury at a cost of $400,000. Mr. Foote was engaged as consultant on this last-mentioned work, and as a result of the association Mr. Stamm entered Mr. Foote's employ.

Mr. Stamm is chairman of the committee on engineering symbols of the American Electric Railway Association, is serving on the committee of buildings and structures of the American Electric Railway Engineering Association, and is chairman of the sub-committee on bus terminal designs.

As an avocation Mr. Stamm turns to music, in which he was educated abroad. Thus Mr. Stamm is an architect, an artist and a musician and in addition, as so often is the case with men trained abroad, he is a linguist with a ready command of several languages.

Chairman Lyman of Brooklyn City Railroad Resigns

Frank Lyman has resigned the chairmanship of the Brooklyn City Railroad, Brooklyn, N. Y. No successor has been named for the office. George W. Jones, vice-president and treasurer, was made a director. Mr. Lyman was president of the Brooklyn City Railroad up to the time of the election of H. H. Porter, the present incumbent. When he turned over the presidency the position of chairman of the board was created especially for Mr. Lyman.

Mr. Lyman's withdrawal from the chairmanship is in keeping with a plan he has had in mind for some time. His connection with the Brooklyn company covers a period of many years, during a large part of which the Brooklyn City Railroad was operated under lease by the Brooklyn Rapid Transit Company, the predecessor of the present Brooklyn-Manhattan Transit Corporation. Following the return of the Brooklyn City Railroad to its owners after default in the terms of the lease by the old Brooklyn Rapid Transit Company Mr. Lyman entered actively into the affairs of the company, the corporate activities of which had been maintained during the period of the lease principally to permit the company to act as a disbursing agent for the rentals received. Mr. Lyman is essentially a financier. He is an officer of many Brooklyn and Manhattan financial institutions.

H. C. Donecker, formerly assistant general manager of the Public Service Railway, Newark, N. J., has become connected with Kelly, Cooke & Company, Philadelphia, Pa., operators of the Chester Valley Lines, a co-ordinated railway and bus system.

Louis Hinds has been appointed cashier of the Morris County Traction Company, Morristown, N. J., succeeding W. D. Dalrymple. Mr. Hinds has been in the employ of the company since Sept. 5, 1918, serving as trainman and dispatcher.

William D. Dalrymple has been appointed auditor of the Morris County Traction Company, Morristown, N. J., succeeding H. C. Robbins, resigned. Mr. Dalrymple has been in the employ of the company for the last thirteen years. He started as storekeeper and was promoted to chief office clerk and paymaster and later was promoted to cashier and assistant auditor.

Obituary

A. O. Backert

A. O. Backert, president of the Penton Publishing Company of Cleveland, Ohio, and for a number of years on the editorial staff of *Iron Trade Review*, died April 24 at the age of 49 years. Mr. Backert was not technically educated, but he learned early in his editorial life the value of study of his specialty and he long since became known as an expert, not only in the business of iron and steel but also in its technology. In his later life when his administrative duties as head of a large publishing company made it impossible for him to continue close editorial contact with his field, he still retained the confidence of the industry and improved every occasion to capitalize that confidence in advice and suggestion to his editorial associates.

Mr. Backert attended Western Reserve University. After some years of newspaper work he joined the staff of *Iron Trade Review* and the *Foundry*, with which he remained until 1906, when he became Western editor of *Iron Age*. In 1908, however, he returned to the *Foundry*, of which he became editor, and *Iron Trade Review*, of which he was engineering editor. In 1913 he became vice-president and general manager of the Penton Publishing Company and in 1924 its president.

Edward Goepper, eldest member of the board of directors of the Cincinnati Street Railway, Cincinnati, Ohio, died at his home in Avondale on April 22.

Col. Lewis Perrine, 65 years old, died on May 3. Of his many activities, Colonel Perrine was best known for his connection with the old horse railways in Trenton and the electrification of those enterprises. His father, the late Gen. Lewis Perrine, was president of the Trenton Horse Railroad. Colonel Perrine was elected secretary-treasurer of the company in 1881, and subsequently was made general manager. In 1891 he purchased the City Railway and consolidated the two companies under the title of the Trenton Passenger Railway. For fifteen years he managed the company. In 1881 Governor Ludlow appointed him assistant quartermaster-general, with the rank of colonel, and he was reappointed by Governor Abbott three years later. He declined the position of quartermaster-general of the state to succeed his father.

Almet N. Broadhead, president of the Jamestown Street Railway, the Chautauqua Traction Company and the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., one of the best known industrial leaders of western New York, died at his home in Jamestown on May 5, at the age of 74 years. Mr. Broadhead was president and held the controlling interest in many of Jamestown's industries, including the Jamestown Worsted Mills and the Broadhead Worsted Mills, the two largest textile industries in the city. He also had large holdings in the local and interurban electric lines of Chautauqua County and in the Chautauqua Lake Navigation Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Double-Deck Buses for Detroit

Many interesting features have been incorporated in the fully inclosed double-deck bus built for, and in co-operation with, the Department of Street Railways, city of Detroit, by the Yellow Coach Manufacturing Company, Chicago. The upper deck and rear staircase are completely inclosed. The lower deck roof is of the monitor type, giving a 74½-in. headroom over the aisle. The over-all height is 12 ft. 8 in.

The body seats 57, 26 on the lower deck and 31 on the upper deck. It is carried on the standard type "Z" Yellow chassis having a 230-in. wheelbase and a six-cylinder, sleeve valve engine. Westinghouse air brakes on the rear wheels are controlled by a pedal.

Lower deck seats are spaced on 30-in. centers. There are eleven cross seats and two longitudinal seats.

With two back-to-back seats placed down the center of the upper deck, the aisles on each side are directly over the lower-deck seats. This arrangement permits a saving in over-all height of 18 in. The upper-deck roof is ¼-in. plywood without carlines, supported at the sides by a narrow side strip carried on the side posts. A light beam down the center, supported by stanchions mounted along the seat back, stiffens the roof. The upper-deck headroom is 69 in. over the aisles.

Interior finish of side posts, panels and trim is mahogany. The ceilings of both decks are finished in stippled white. Seats are upholstered in brown Spanish leather. Brown battleship linoleum is used on the lower floor. Upper deck aisles are covered with anti-skid runners.

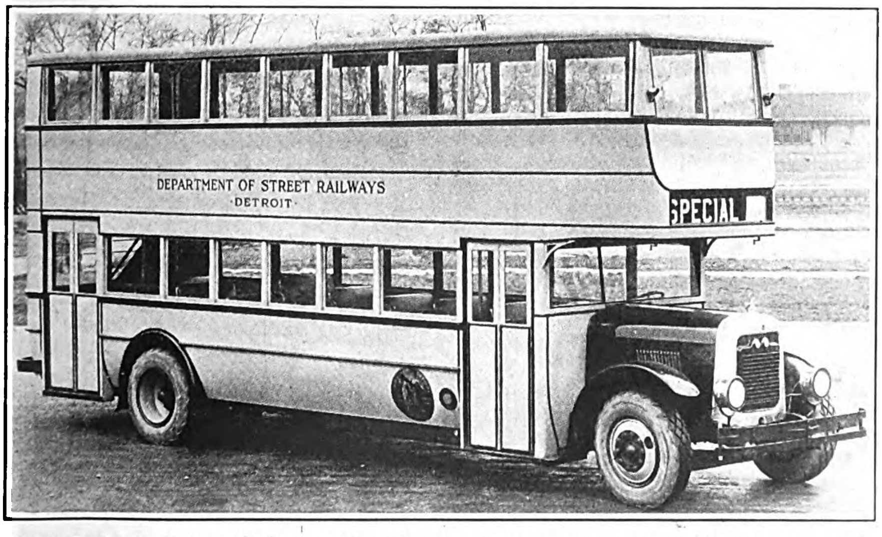
Ten opal glass dome lights with 21-cp. lamps are mounted in the monitor risers, five on each side. The upper deck is lighted by eight lamps of the same type, spaced down the center of the ceiling and set flush.

External appearance has been given particular attention. A streamline effect is carried from the front to rear. The two doors follow the lines of the body in the position of sash and step. At the rear the curve is continuous rather than flat. The upper deck side posts slant in a slight amount and the roof has a particularly flat curvature.

Two jack-knife folding doors serve the lower deck. The forward door is controlled by the driver. It incloses a single step to the front entrance space. The driver's position is close to the left side of the body. The rear door may be operated by the conductor, or it may be locked for one-man operation.

Future Lumber Supply Assured

The available stands of merchantable Southern pine timber since 1919 have decreased from about 260,000,000,000 board-feet to 220,000,000,000 board-feet, and production has increased to such an extent that the 1924 cut was approximately 16,000,000,000 ft., which is close to the maximum production for any year. These are the two outstanding facts revealed in the detailed survey of the Southern Pine producing territories by the Southern Pine Association undertaken approximately a year ago. The survey is the second it has made in the past five years. New tree growth is estimated at about 7,000,000,000 ft. a year, which deducted from the annual average cut (1919-1924) of 15,000,000,000 ft., means a yearly reduction during this period of 8,000,000,000 ft. The survey indicates that there is assured a perpetual supply of Southern pine in volume at least equal to one-half the present production.



Fully Inclosed Double-Deck Bus Has Front and Rear Entrance, Inside Stairway and Leather Upholstered Seats. It Seats 31 Upstairs and 26 Below, with Over-All Height of 12 Ft. 8 In.

Public Relations Messages Reprinted by Westinghouse

During past years the Westinghouse Electric & Manufacturing Company has been responsible for regular appearances of public relations good will advertisements in several of the leading popular media of the country. Its past endeavor in this direction the company has now crystallized in the reproduction in color of eighteen of these public relations messages in a special publication "Adequate Transportation Facilities, the Basis for Industrial and Social Progress—Telling the Public the Facts."

The messages incorporated in the type of advertisements that have appeared are intended to impress on the mind of the public the fact that the transportation system is dependable and that because of this the public should encourage and support the electric railways. By these messages also the public has been acquainted with the problems of this utility from several angles. Many expressions of appreciation have tended to strengthen the company's faith in this work with the result that it is now proposed to keep on with the program.

Any railway has the privilege of using the messages contained in the book in the interest of its own service.

New Selden Truck Corporation Formed

A new Selden Truck Corporation at Rochester, N. Y., has just been organized and will continue without interruption the manufacture, sale and service of Selden trucks which was begun in 1913. The former Selden Truck Corporation, which was formed in 1919 by consolidating the Selden Motor Vehicle Company and Selden Truck Sales Company, has been legally dissolved.

The management and operations of the Selden plant will be continued by the former executives. The Fabric Body Corporation, Detroit, the new owners of the Selden Truck Corporation, will act as holding company.

Fabric bus bodies will shortly be built in the Selden plant at Rochester.

The new corporation is amply financed to carry on the rapidly growing business in buses and motor trucks and production has already been increased to take care of the largest number of unfilled orders since the spring of 1920.

Metal, Coal and Material Prices

Metals—New York	May 5, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.75
Zinc, cents per lb	6.925
Tin, Straits, cents per lb	54.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.50
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.03

Bus Business Reported Good by Pierce-Arrow

Production and sales of Pierce-Arrow buses are double this year what they were in the same period for 1924. Pierce-Arrow officials ascribe the increase in sales of commercial vehicles to better business conditions and a more complete knowledge of the value of Pierce-Arrow equipment in both the truck and bus field. Another factor in the growth of the commercial vehicle business is the increase in hard-surfaced highways.

Rolling Stock

Southern Public Utilities Company, Charlotte, N. C., will soon receive the last two of the six new cars ordered for Greenville, S. C., and referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 11, page 606. The bodies were built by the Perley A. Thomas Car Works, High Point, N. C. They will be mounted on Brill trucks. They are double-truck safety cars intended for one-man operation. Each car is 40 ft. long, weighs 32,000 lb., seats 46 passengers and is equipped with Ohmer registers. Double doors permit passengers to load while other passengers are being discharged.

Bloomington & Normal Railway & Light Company, Bloomington, Ill., has ordered six city-type Mack buses.

Lehigh Traction Company, Hazleton, Pa., recently ordered ten 25-passenger city-type Mack buses.

Omaha & Lincoln Railway & Light Company, Ralston, Neb., has ordered a 25-passenger Mack city-type bus which is to be placed in service on its 4-mile route between Ralston and Omaha.

Jacksonville Traction Company, Jacksonville, Fla., is expecting delivery on two new cars by June 1.

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, has purchased two 25-passenger Mack buses for its Cedar Rapids-Tipton line. The new buses are similar to the one that has been operating.

Kentucky Traction & Terminal Company, Lexington, Ky., has just purchased four White 25-passenger buses for a loop line in Lexington. They will be fitted with Kuhlman bodies.

Track and Line

New York, Westchester & Boston Railway, New York, N. Y., has awarded a contract to Dwight P. Robinson & Company, Inc., for the extension of its double-track electric system from Larchmont to Mamaroneck.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been urged to extend its double-track system on Vliet Street from 47th Street west to 60th Street in a resolution now under consideration by the Common Council.

Cincinnati Traction Company, Cincinnati, Ohio, contemplates spending $500,000 for track reconstruction and $250,000 for track maintenance and repairs in the next seven months.

Rome Railway & Light Company, Rome, Ga., is extending its line along North Fifth Avenue to Alabama Road.

Morris County Traction Company, Morristown, N. J., is rebuilding 1 mile of double track at Springfield, N. J. New 6-in. T-rails and International steel ties are being laid in concrete. The company is also arranging to rebuild and repave 1 mile of track in Summit, using steel ties. This road is also to be laid in concrete.

Dallas Southwestern Traction Company, Dallas, Tex., through its counsel, has filed an application at Washington for authority to construct a new line from Commerce Street, Dallas, through West Dallas, Cement City, Harry's, Gates Eagle Ford, Kits, and terminating at Irving, Tex., a total of 10.4 miles of main track, with no branch lines. The road would finance the undertaking by a bond issue of $1,250,000.

Wisconsin Power & Light Company, Fond du Lac, Wis., plans to replace the present 60-lb. rail with new rails of the 80-lb. type on new ties from Fond du Lac, Oshkosh and Neenah.

Houston Electric Company, Houston, Tex., plans to extend its Woodland Heights line into the Brooksmith addition.

Trade Notes

J. G. White Management Corporation, New York, announces the removal of its offices to the Federal Reserve Bank Building, 33 Liberty Street, New York.

American High-Speed Chain Company has appointed E. G. Long Company, New York, selling agents in New York and vicinity. Sales promotion will be in charge of Wilbur E. Petty as heretofore.

Haskelite Manufacturing Corporation, Chicago, Ill., has opened a branch office at 152 West 42d Street, New York City. James J. Dunne, Eastern representative, will be in charge.

Acme Wire Company, New Haven, Conn., has removed its sales office from 53 West Jackson Boulevard, Chicago, to 427 West Erie Street, Chicago, where a warehouse will be opened carrying stocks of all Acme wire products as an added service to customers who are now being served by this district sales office.

Industrial Works, Bay City, Mich., manufacturers of locomotive cranes and crane equipment, announces the opening of two new district offices, one at 425 Whitney Central Building, New Orleans, La., in charge of John A. Abele, district sales manager, and the other at 843-A Hurt Building, Atlanta, Ga., in charge of John J. Murphy, district sales manager. The works also announces the appointment of four additional district sales engineers. Douglas J. Calder, Conway J. Neacy and Monroe J. Frankel will have offices at the Chicago district office, 1051 McCormick Building, and Chester F. Delbridge will be at the St. Louis district office, Railway Exchange Building.

National Carbon Company, Inc., New York, N. Y., has just moved its emergency brush finishing plant into new quarters at 357 West 36th Street. For the past two years this plant has been maintained at 237 East 41st Street. The company states that the new location gives larger quarters which have become necessary to take care of the increasing volume of this class of service. This is only one of four similar emergency stations maintained by the National Carbon Company as auxiliaries to its main factory in Cleveland, Ohio. The others are located at Pittsburgh, Pa.; Chicago, Ill., and Cleveland, Ohio.

Electric Service Supplies Company, Philadelphia, Pa., announces the opening of a branch sales office in the General Motors Building, Detroit, in charge of Harry A. Stone. This office has been opened so that the constantly increasing business in that territory can be handled to better advantage.

Standard Steel Car Company and subsidiary companies announce the removal of their New York offices to 120 Broadway, Rooms 2103-2113.

Garford Motor Truck Company, Lima, Ohio, has announced the election of C. M. Allen to the presidency to succeed E. R. Curtin.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., announces an opinion by the United States Circuit Court of Appeals for the Second Circuit in New York City in the case of Vapor Car Heating Company, Inc., and Egbert H. Gold against Gold Car Heating & Lighting Company and Edward E. Gold, rendered April 6, in which all of the three Judges of the court unanimously held invalid U. S. Patent No. 886,969, dated May 5, 1908, owned by the Vapor Car Heating Company, Inc., broadly covering the heating of cars by the vapor system.

Sullivan Machinery Company, Chicago, Ill., has removed its Dallas, Tex., office from the western Indemnity Building to rooms 522-523 Santa Fé Building. Sullivan air compressors and hammer drills and repair parts are carried in stock in the same building. Additional space and shipping facilities, thus provided, will permit improved service for the customers of the company in territory served by the Dallas office. David H. Hunter is manager. The company announces the appointment of Earl E. Miller as manager at its El Paso, Tex., branch office, succeeding R. S. Weiner, who is transferred to the general office in Chicago.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 24 on "Arktite" circuit-breaking plugs and receptacles.

J. E. Loudon & Company, Boston, Mass., has issued a booklet on Mahanite bearings, called "They Stay on the Job."

American Electrical Works, Phillipsdale, R. I., has issued a 200-page illustrated booklet in loose-leaf form with a leather cover, describing in detail the products manufactured under the trade name "Amelectric." The book contains tables, data and general engineering information. A short history of the company is included.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 16, 1925 *Number* 20

Thorough Repairs Are Cheapest Eventually

CHECKING over costs for maintaining motors for electric railway service, the advantage of having a sufficient number of spare parts to give ample time for a thorough job of repairs is conspicuous. In the maintenance of railway equipment first cost is frequently given too much consideration. In order to keep cars in service a damaged armature may be hurriedly patched up and put in the motor frame, whereas if a spare armature or spare motor were available additional time would be taken to make a thorough repair job. The car receiving the hurriedly repaired armature soon comes back into the shop for motor trouble. Frequently trouble develops in other parts of the equipment as the result of the hurried workmanship. Records of motor trouble in some instances show that the same motor has been worked on three or four times in as many months. When the costs of bringing the car into the shop and jacking it up so as to remove the motor and the additional loss from service are considered, the resulting expense will be much greater.

Comparison with records of roads which have ample spare equipment shows that the extra equipment soon pays for itself in lessened maintenance cost. In order to reduce the number of spares required to permit efficient repair work to be done, one railway is using the trucks and motors from cars which are in for general overhauling and painting to replace similar parts that have developed defects in service. These cars remain in the shops from one to two weeks and before this system was adopted these trucks, together with the motor equipment, were idle during the entire period. Now as soon as a car is placed in the shop and the truck motors are removed the motors are used as spares to facilitate overhauling of other cars as they come in. When the cars are ready to be returned to service after the general overhauling other cars being brought in furnish spare equipment. Such a scheduling of repairs and reuse of the motors as spares is well worth consideration.

Well-Maintained Shop Tools Increase Production

SHOP forces of electric railways are schooled in the necessity of high-class maintenance of cars and equipment, so that the value of regular and systematic inspections is well appreciated. But when it comes to the maintenance of shop tools there are very few railways where regular inspections and repairs are made of these important pieces of machinery. In poorly managed shops repairs are not made until the equipment breaks down. Frequently lost time must be made up by overtime work in order that cars may be returned promptly to service. A half hour lost through a broken belt on a machine tool or a derailed overhead hoist frequently causes enforced idleness of several men. As an example of a different kind, a lathe with worn ways produces inaccurate work. No matter how good a machinist the workman may be, a poor fit is made, increased wear of the equipment results after it is placed in service, and removal and replacement become necessary after a shorter interval than would otherwise be necessary.

A well arranged shop will have in its organization a man designated to have supervision over the machine tools, and see to it that repairs are made before failures result. Regular periods of inspection should be established. Each machine should be gone over carefully, and any worn-out or broken parts renewed or replaced as an insurance against failure. Such a system would establish standards for doing the various types of work that are necessary in maintaining the shop equipment. Shafting and loose pulleys should be oiled at regular intervals, as a preventive of hot boxes or increased friction. The wear of moving parts of the machine tools themselves should be checked and adjustments made so as to insure accurate work.

A record of the repairs made to shop equipment and the intervals at which such repairs are necessary will also disclose valuable information. Such a record should also be invaluable when new tools are to be purchased, as it would include information pertaining to parts liable to failure, and so disclose weaknesses in construction capable of remedy in new designs. In large shops the organization should be so arranged as to take care of the inspection and repair of the tools, and individual men should be assigned to each class of work. In small shops one man may be designated to look after all the machine tools. This person may solicit the co-operation of the foremen in charge of the various departments. Through proper team work of this sort many machine failures will be eliminated.

Co-operative Buying Has Possibilities for the Smaller Railways

PURCHASING material in large quantities is a well-known and widely practiced method of securing price reductions from manufacturers. While the method is widely and successfully used by large concerns, it does not work out so well when only small quantities are needed. From the point of view of the small electric railway it is open to the objection that when the material purchased is consumed slowly, a considerable sum of money is likely to be tied up in the storeroom. Yet such a company is the very one to which the economy of buying wholesale has the greatest appeal.

One possible way out of the difficulty is co-operative buying. This principle has been successfully practiced by a number of the larger systems which really are only combinations of several smaller railways in separate towns. By having all purchases made through a single

This is the issue in May that is devoted essentially to maintenance subjects

agency at the company headquarters the volume of business has been sufficient that extremely favorable prices have been obtained. The total quantity of material, however, was not much in excess of the current needs of the several divisions, and no great amount of capital was tied up in purchases made in large lots.

A similar plan could be followed by a number of independent railways in the same territory. The lower prices which could thus be secured would be a strong inducement to the individual managers to waive certain details of their own particular specifications.

Against the idea of co-operative buying it may be argued that the advantage of doing business with local merchants would be lost. If their prices were higher than those secured by a common purchasing agent, this might be the case. In reality, the local seller would be likely to reduce his price to keep the business. Thus the mere existence of the co-operative plan would achieve savings for the railways.

Three Years of Municipal Ownership

THREE years ago on May 15 the city of Detroit, Mich., took over the local lines of the Detroit United Railway. Previously the city had built about 50 miles of electric railway as a nucleus of a more extended municipal system. So far as matters between the city and the private company were concerned they had come to an impassé. With the rights and wrongs there is no concern at this time. Detroit made its choice. That choice was for municipal ownership and operation. To use a mixed mataphor, municipal ownership at Detroit is sailing the sea and riding the waves almost perfectly. It may be that the boat will later go aground. If it does, it will only be following the course of many similar municipal enterprises, but there is no evidence now of any gathering storm.

The Detroit management has done many progressive things. It has built well for the future. Perhaps the circumstances were unduly auspicious, but good opportunities are not in themselves an open sesame to achievement. Detroit has been able to spend money freely. But if it has spent freely, it has also spent wisely. Much of the work done there has been the subject of comment in these pages. A good idea is a good idea no matter by whom conceived. And some of the ideas at Detroit have blazed new paths not only in engineering, but in the sale of transportation.

There is a school of thought to the votaries of which the very words "municipal ownership" and "municipal operation" are anathema. For their benefit it should be made plain that ELECTRIC RAILWAY JOURNAL holds no brief for municipal ownership—much less municipal operation. It still thinks that with the proper private management Detroit would be much better off than it is today. This occasion demands only that criticism be fair. The Detroit management built up a personnel drawn largely from the ranks of skilled operators previously engaged on private enterprises. In that respect the Board of Street Railway Commissioners acted wisely. Perhaps that accounts largely for the progress made. These men, many of them active members of the American Electric Railway Association, have given to their employers—in this case the city—the best that is in them. There certainly is more than a morsel of pride to the industry in this fact. The men not so drawn have shown themselves to be most readily adaptable to new surroundings. All of these men may be expected to function efficiently only so long as there is no attempt at domination from outside sources. These are the conditions under which they functioned in private enterprises. When the bird of political patronage flies in at the window the competent ones will begin to go out by the door. It is anybody's guess how long it will be before that event takes place.

Open Shop Case at Cleveland Commands Attention

EMPLOYEES of the Cleveland Railway have voted not to go out on strike in an effort to enforce their demands for an increase in wages of 10 cents an hour. It is a wise move. It is also the latest development in Cleveland in the controversy between the railway and the Amalgamated. As news it is entitled to a place in the first paragraph, but there is more to the matter in Cleveland than that—a great deal more—significant as was that vote, taken by itself.

Even more important, however, is it that hereafter the Cleveland Railway will be operated on the open shop basis. The declaration of the open shop followed only after the issue had been fought out in the courts. It is impossible here to follow all the moves in this year-old controversy. Suffice it to say that the company a year ago rejected an award to the men of 12 cents an hour—they had asked 15—by an arbitration board on the ground that the key arbitrator, a former street railway commissioner of the city, was biased against the company. The union asked the court to uphold the award. Finally, the Court of Appeals not only held the 12-cent wage award illegal, but also set aside the closed shop contract between the company and the men on the ground that it was contrary to public policy. The Supreme Court sustained the ruling. In its comment on the law of contracts the learned court said:

> Contracts by which an employer agrees to employ only union labor are contrary to public policy when they take in an entire industry of any considerable proportions in a community so that they operate generally in that community to prevent or seriously deter craftsmen from working at their craft or workmen from obtaining employment under favorable conditions without joining a union. And such was the contract here, and it must necessarily be held to be in conflict with the public policy of our law, and illegal and void. The universal trend of authorities supports this position.

The entire discussion of the case by the court is of interest, but particular significant is this paragraph. The court decision is not a blow against collective bargaining nor against the fundamentals of unionism. It does, however, mean an end in Ohio at least to closed shop agreements in the electric railway industry.

For pushing this case through to a successful conclusion the electric railway industry is indebted to John J. Stanley, president of the company, and to Paul Wilson, its secretary. Mr. Stanley is not given to domination. Neither is he the kind to stand by and accept domination. He has announced an increase in pay of 5 cents an hour and has stated that in the future controversies will be settled by conference between company officials and employees of the company chosen by the employees themselves.

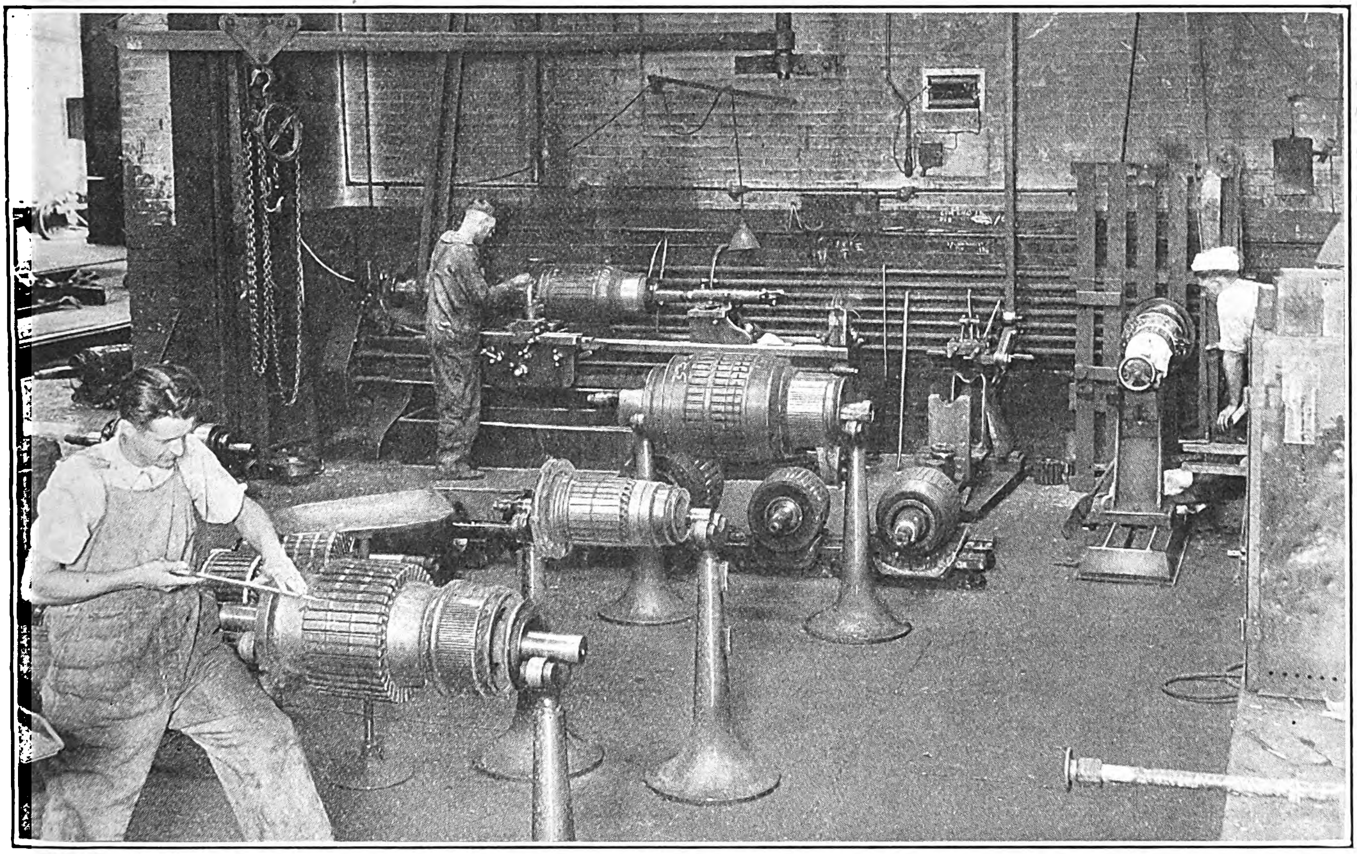
So far as the union is concerned the case appears to be one more instance of greed on the part of organized labor overreaching itself and pulling down upon its head its whole house, built up in Cleveland over a period of more than twenty years.

Reducing Motor Failures at Syracuse by Better Maintenance

By L. E. Worlock

Foreman of Armature and Controller Department, New York State Railways, Syracuse Lines

Program for Dipping and Baking Motor Armatures and Fields Started at the Wolf Street Shops of New York State Railways Two Years Ago Has Reduced Breakdowns Materially — Equipment and Methods for Doing Work Described



Repairing Armatures in the Wolf Street Shops of the Syracuse Lines, New York State Railways

SINCE the program of dipping and baking armatures and field coils was started at the Wolf Street shops of the New York State Railways, Syracuse Lines, a little more than two years ago, the methods used have proved effective in preventing insulation troubles caused by water and dirt. By applying a dipping and baking treatment to armatures that have been in service for a year renewed life is given to the insulation, cracks and pores are closed up and the coils are held tightly in the slots, preventing failures caused by vibration. This method has proved so successful that in two years only 0.5 per cent of the armatures and 0.67 per cent of the field coils so treated have failed in service.

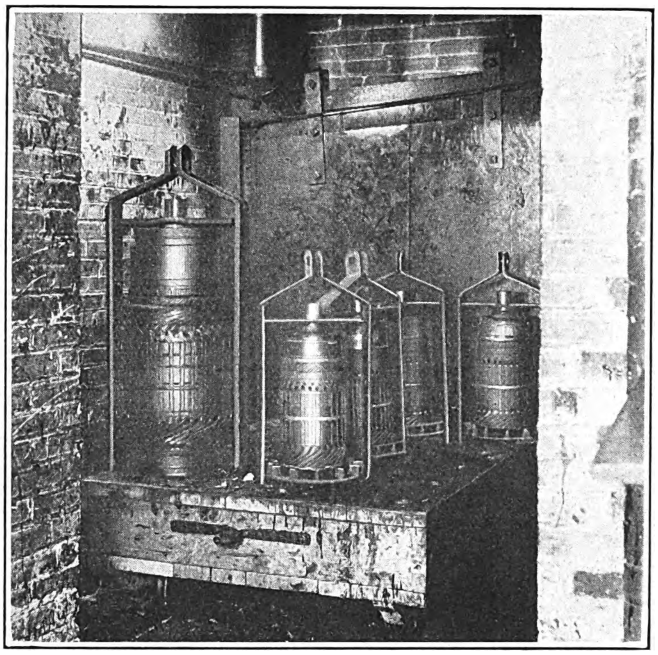
PROCEDURE IN REPAIRING ARMATURES

When an armature is brought to the shop for overhauling the first step in the process of getting it ready for dipping and baking is to remove the canvas hood and the bands. Dry compressed air is then used to blow out the armature carefully so as to remove all carbon dust and dirt. Oil and grease are removed from the shaft and thrust collars by scrubbing their surfaces with gasoline.

The armature having received this treatment, core bands are again put on, care being taken that sufficient pressure is supplied by them to the coils. In some cases the coils have shrunk to such an extent that their top surfaces are below the level of the core bands. For armatures in this condition fillers consisting of narrow strips of canvas are placed in the slots on top of the coils. These give a surface for the bands to rest on and insure that the coils will be drawn permanently into position and held tightly.

After preparation for baking, the armature is placed in the oven, where it is heated to a temperature of from 200 to 210 deg. F. This baking is continued from three to six hours, which suffices to dry out all moisture, and it opens the pores of the insulation so that the insulating varnish will be able to penetrate readily.

The baking completed, the armature is removed from the oven and taken at once to the dipping tank, where



Armatures Are Placed on a Hand Truck and Run Directly Into the Baking Oven

it is dipped while hot into the insulating varnish and allowed to remain for a period of from 20 to 30 minutes. Armatures are dipped with the shaft in a vertical position, pinion end downward. Dipping the armatures in the upright position has been found desirable in order to prevent the varnish from pocketing in the leads behind the commutator.

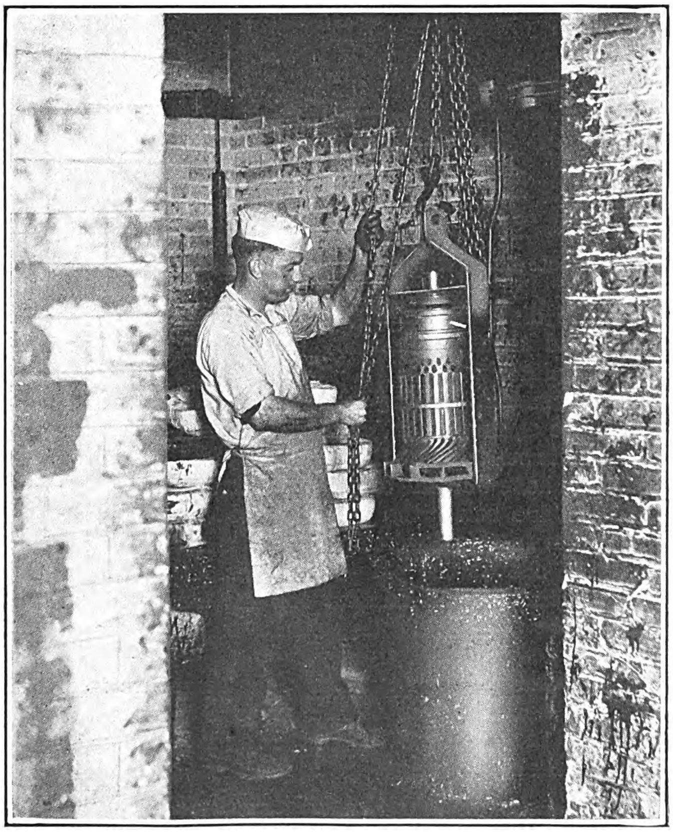
An effective means of transferring the armatures in this position by the overhead crane is made possible by the use of cradles. These have been made to fit each size of armature. They are made up of two flat steel bars, one going on either side of the armature. The lower ends terminate in hooks which reach under the end bells at the pinion end, while the upper ends are drilled to take the hook of the tackle. The upper end of the armature is held by a cross bar, which is bored in the center to pass over the shaft, and whose ends press against the side bars. Several of these cradles and the method of using them are illustrated in the pictures on this page.

Following the dipping, the armature is placed on a drain board and allowed to remain there until the surplus varnish stops dripping out. It is then placed in the oven and baked at a temperature of 200 to 210 deg. F. for a period of 36 to 72 hours, depending on the size.

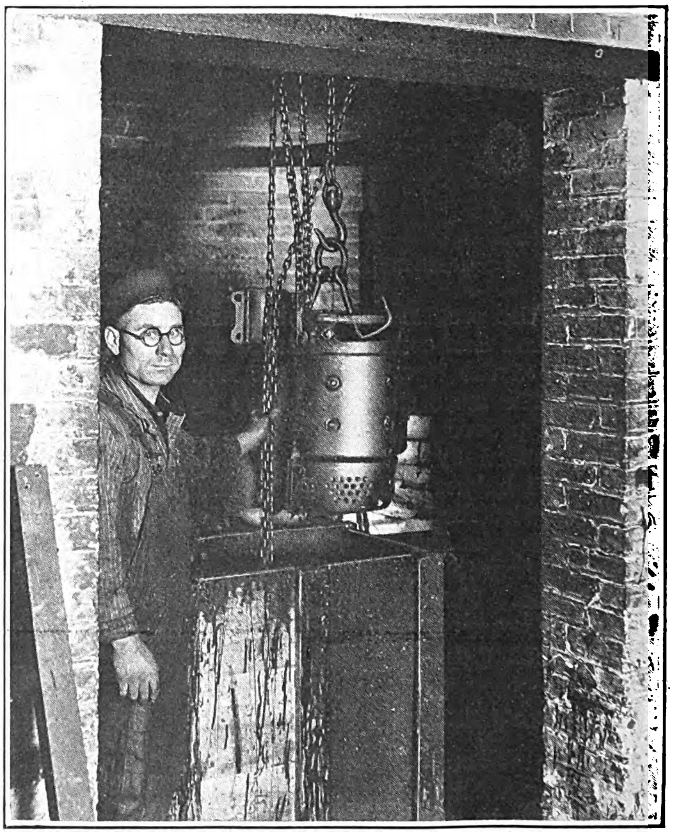
OVEN AND DIPPING TANK IN SEPARATE BUILDING

The building where the dipping and baking are carried out is located just outside of and adjoining the truck shop. It is built of bricks, with floor dimensions of 10 ft. x 18 ft. A wall in the middle divides the building into two sections. The rear portion is used for the baking oven. Heat is supplied by electric heaters. These are thermostatically controlled so that the temperature is kept accurately within the limits of 200 and 210 deg. F.

The front portion of the building contains the dipping tank. This is 24 in. x 48 in. and is sunk into the ground part way so that 24 in. projects above the floor level. The tank is connected by a 2-in. supply pipe with a 100-gal. supply reservoir, located in the rear outside of the building, which contains the baking varnish. Compressed air is used to force the baking varnish from the reservoir into the dipping tank. The varnish runs back into the reservoir by gravity when the air pressure is removed. Varnish to make up for



Dipping a Small Armature. Note the Cradle Which Is Used to Keep the Armature in a Vertical Position



Shells for Small Motors Are Dipped and Baked After the Field Coils Have Been Put in Place that used is placed in the dipping tank, from where it runs into the reservoir. Electric heaters placed in the housing of the supply reservoir keep the varnish at a temperature as nearly as possible the same as that which the armatures and field coils have attained after drying out. This gives better penetration of the varnish and speeds up the operation.

Armatures are brought to the dipping room on trucks. Then they are picked up by a chain hoist which is attached to a jib crane, by means of which they are handled into and out of the dipping tank. After the dipping and draining the armatures are placed in an upright position on a four-wheel truck, which runs on a track directly into the baking oven. The top of the truck has holes so spaced that the armatures can remain in an upright position during the baking. The truck is moved into and out of the oven by means of a handle which engages an eye on the front end of the truck. The truck with several armatures in position in their cradles is shown in the upper illustration on the preceding page.

Following the baking period the armatures are taken to the armature room and rebanded. Next they are tested for insulation strength at 1,000 volts a.c., and also are tested for short circuits. The canvas hoods are then placed in position and banded down.

Commutators are trued up on a lathe as the next operation. It is the practice to use only slotted commutators on the property, so that if needed the mica is undercut. The last operation in finishing the armature is to fit bearings individually to each shaft. They remain on the shafts until the machines are placed on the trucks, so that there will be no chance of misplacing them. A description of this method of fitting bearings and keeping them with the armatures was published in ELECTRIC RAILWAY JOURNAL for April 25, page 665.

FAILURES HAVE BEEN GREATLY REDUCED

During the two-year period that the dipping and baking of armatures has been caried out at the Wolf Street shops, as described, a total of 406 armatures have been given this treatment. Nearly 4,000 field coils for the larger motors and 1,200 fields for the Westinghouse 506-A motors have been dipped and baked. There have been but two breakdowns of armatures that have been treated, or 0.5 per cent. Field coil failures have averaged only 0.67 per cent following the reinsulating, dipping and baking.

Some trouble has been experienced with the smaller railway motors of the ventilated type due to the penetration of water inside the shell, causing grounds or short circuits. This is due in part to the design of the motor shell and also to the use of this type of machine on wheels of small diameter, so that the motors are considerably closer to the track than are the larger types. Thus they are subjected to considerably more splashing during the periods of the year when the tracks are covered with water and slush.

As a means of overcoming failures of this type and also as an added precaution in order to provide better insulation, the shells of motors of these small types are dipped in insulating varnish, after the fields have been assembled in place but before the armature has been put in. Following the dipping these shells are baked in the oven until the varnish is set thoroughly. This procedure fills in all small cracks in the fields and helps to hold them tightly in place on the pole pieces. It also provides a waterproof covering.

Wheel Service Compared

Mileage and Cost per Thousand Car-Miles Given for Three Properties Include Service Performance of Cast-Iron, Cast-Steel and Rolled-Steel Wheels

FIGURES obtained from service records of three important city properties on the performance records of various types of car wheels show some interesting comparisons as to mileage obtained and cost. The mileage for cast-iron, cast-steel and rolled-steel wheels in service on the lines of the Washington Railway & Electric Company, Washington, D. C., was published in ELECTRIC RAILWAY JOURNAL for Nov. 17, 1923, page 863, as a communication from R. D. Voshall, superintendent of equipment and buildings of that company.

TABLE I—WHEEL MILEAGES FOR YEAR 1923, WASHINGTON RAILWAY & ELECTRIC COMPANY

Type of Wheel	Average Miles	Cost per 1,000 Miles
20-in. cast iron	41,830	$0.132
22-in. cast iron	39,604	.171
30-in. cast iron	38,973	.238
33-in. cast iron	38,118	.289
30-in. cast steel	72,463	.446
33-in. cast steel	96,963	.345
31-in. rolled steel	99,400	.347

At that time figures for the first six months of 1923 only were available. These figures have now been completed for the entire year of 1923 and are given in Table I. Additional data for mileage and costs of wheels have been obtained from the Northern Texas Traction Company, Fort Worth, Tex., and the Key System Transit Company, Oakland, Cal.

An interesting point was brought out by Mr. Voshall in the previous article. This was that a large amount of the company's track is equipped with a rail having a very narrow groove, the clearance over the wheel flange being only ⅛ in. This causes rapid wear on the back side of the flange and of course reduces the mileage obtained. The accompanying tabulation shows that while the average mileage for cast-iron wheels is considerably less than for cast-steel and rolled-steel wheels, still the cost per 1,000 miles is less than for the other types.

TABLE II—SERVICE OF CAR WHEELS DISCARDED FOR FOUR YEARS, 1920-1923, NORTHERN TEXAS TRACTION COMPANY

Type	Number of Wheels	Life in Miles		First Cost per 1,000 Car-Miles per Wheel, Cents
		Total	Average per Wheel	
21-in. cast iron	290	13,708,390	47,270	13.7
22-in. cast steel	58	6,516,370	112,351	22.2
24-in. cast iron	194	6,634,002	34,196	20.35
24-in. cast steel	242	26,471,618	109,387	25.3
24-in. rolled steel	42	6,110,342	145,484	12.7
33-in. cast iron	404	12,436,932	30,784	37.1
34-in. cast steel	22	3,066,872	139,403	23.5
34-in. rolled steel	26	3,742,378	143,937	27.1
36-in. rolled steel	16	3,353,904	209,619	21.3
37-in. rolled steel	104	20,017,730	192,478	25.7

The Northern Texas Traction Company, Fort Worth, Tex., has had considerable experience with the three types of wheels and also has made some extensive tests. The company endeavored to find a wheel which would give a longer life between changes than cast-iron wheels. Beginning in 1918, some 200 pairs of 24-in. cast-steel wheels were installed.

These wheels were of a one-wear type. After the first wear various means of reclamation were tried in order to increase the mileage. An electric welder was used to build up holes in the tread, and the surplus metal was ground off. By this means it was found possible to get an additional 30,000 miles of service, but the reclamation expenses were rather high.

Rolled-steel wheels were also tried. These have made a better showing than the cast-steel wheels due to lower first cost, longer life and lower reclamation costs. These rolled-steel wheels are made to give more than one wear.

In Tables II to V information is given for the various types of wheels. Table II shows for the years 1920-1923 inclusive the number of wheels in service, the total life mileage, the average mileage per wheel, and the cost for 1,000 car-miles per wheel, taking the first cost only and not including costs for removal, replacement and re-turning. Table III gives a comparison of 24-in. rolled-steel and cast-steel wheels with cast-iron wheels of the same diameter for service and cost up to their first removal. Some of the causes for the first removal of wheels were worn or sharp flanges, defective and worn treads, and defects in the manufacture of the wheels. This comparison shows that neither rolled nor cast-steel wheels, when considered as a one-wear wheel like the cast-iron, reach the low cost per 1,000 car-miles that the cast-iron wheels do, although the rolled-steel wheels approach it very closely. J. T. Porter, master mechanic, who is following this investigation, states that so far no attempt has been made to standardize on any one type of wheel to the exclusion of others, but the tests are being continued as he believes that records of a few wheels over a short period of time are of little value.

A complete analysis of costs for 24-in. wheels is given in Table IV. This takes into consideration the additional mileage obtained from rolled-steel wheels after turning and includes figures for costs of removal, re-turning and replacement of all types of wheels, as given in Table V. This analysis shows that in order to get a mileage of 6,110,342, which was obtained from the 42 rolled-steel wheels tested, a total of 179 cast-iron or 56 cast-steel wheels would be needed. In obtaining this mileage it is necessary to change 68½ pairs of cast-iron wheels or seven pairs of cast-steel wheels, and in making this mileage 31½ pairs of rolled-steel wheels would be removed, turned and replaced.

The low first cost of the 24-in. rolled-steel wheels required to make the total mileage of 6,110,342 brings the cost per thousand car-miles with all factors taken into consideration down to 15.3 cents as compared with 25.6 cents for cast-iron and 26 cents for cast-steel wheels. The rolled-steel wheels used in this case are intended to give more than one wear, and by reclamation a total life of 145,484 miles per wheel has been obtained at Fort Worth.

In considering relative wheel mileages and costs for different systems, some information furnished by W. P. Jackson, master mechanic Key System Transit Company, Oakland, Cal., is of special interest.

TABLE III—COMPARISON OF 24-IN. ROLLED-STEEL AND CAST-STEEL CAR WHEELS WITH 24-IN. CAST-IRON WHEELS TO THE FIRST REMOVAL FOR WHEEL DEFECTS, NORTHERN TEXAS TRACTION COMPANY

Type	Number of Wheels	Life in Miles		Cost per 1,000 Car-Miles per Wheel to First Removal, Cents
		Total	Average per Wheel	
24-in. cast iron	194	6,634,002	34,196	20.35
24-in. cast steel	264	21,171,784	80,196	34.6
24-in. rolled steel	70	5,370,962	76,728	24.1

TABLE IV—COMPARISON OF LIFE AND COSTS FOR 24-IN. WHEELS, NORTHERN TEXAS TRACTION COMPANY

Type	Cast Iron	Cast Steel	Rolled Steel
Total number of wheels tested	194	242	42
Total life mileage	6,634,002	26,471,618	6,110,342
Number of wheels necessary to make 6,110,342 miles	179	56	42
Pairs of wheels:			
Removed and replaced	68½	7	....
Re-turned and replaced	....	....	31½
First cost of each wheel	$6.96	$27.77	$18.50
Total first cost	$1,245.84	$1,555.12	$777.00
Additional costs:			
Removal and replacement	321.95	32.90	....
Re-turning and replacement	....	....	156.87
Total cost	$1,567.79	$1,588.02	$933.87
Cost per 1,000 car-miles, cents	25.6	26.0	15.3

TABLE V—LABOR COSTS FOR REMOVING AND REPLACING WHEELS AT FORT WORTH, TEX.

	Man-Hours	Rate	Total Cost
Removing and replacing wheels in car	2 2	$0.45 .35	$0.90 .70
Removing and replacing ball bearing boxes on journals	2 2	.55 .45	1.10 .90
Boring new wheels	1	.55	.55
Pressing wheels off and on	1	.55	.55
Total cost per pair of wheels			$4.70

By a like analysis of time necessary to reclaim a pair of 24-in. rolled steel wheels by turning to restore the flanges, the cost was found to be $4.98 per pair.

In studying this information, shown in Table VI, consideration should be given to the following characteristics of the service in which the wheels operate. The 21-in. wheels are used in city trailer service, with an average light load per wheel of 3,500 lb. The 24-in. wheels are used in city motor service with an average light load per wheel of 4,700 lb. The 30-in. wheels are used in two types of service; 60 per cent of them are in city motor service with an average light load per wheel of 5,000 lb., and 40 per cent are in city trailer service, with an average light load per wheel of 4,000 lb.

There are two types of 33-in. wheels given. Those listed first in the tabulation are used in city motor service, with an average light load per wheel of 6,000 lb. The second lot of seventeen wheels given in the tabulation have M. C. B. treads and flanges. Of these, 75 per cent are in trailer flat cars, with an average light load per wheel of 4,000 lb., and 25 per cent are in city motor car service, with a light load per wheel of 5,000 lb.

The 34-in. wheels are all used in suburban service. Of these 50 per cent are trailer wheels with an average light load per wheel of 6,700 lb., and 50 per cent are motor-driven wheels, with an average light load of 8,000 lb. per wheel. The 36-in. wheels have M. C. B. tread and flange and are all in suburban service. Of these, 50 per cent are trailer wheels, with an average light load per wheel of 8,700 lb., and 50 per cent are motor-driven wheels with a light load per wheel of 10,500 lb.

TABLE VI—MILEAGE AND COST PER THOUSAND WHEEL-MILES OF ALL WHEELS SCRAPPED DURING YEAR 1923 BY KEY SYSTEM TRANSIT COMPANY

Number of Wheels	Diam. Inches	Type	Mileage				Original Cost			Weight, New	Lb. Scrap	Total Cost
			Maximum	Minimum	Average	Total	Gross	Less Scrap Credit	Net per Thousand Wheel-Miles			
138	21	Chilled iron	126,151	23,426	65,165	8,992,735	$7.76	$6.14	$0.094	240	216	$847.32
198	24	Chilled iron	131,291	27,760	60,386	11,956,470	10.04	7.94	.132	314	280	1,574.21
409	30	Chilled iron	250,661	31,360	90,478	37,005,687	12.20	9.27	.102	433	390	3,756.36
288	33	Chilled iron	167,458	27,900	82,028	23,623,958	15.23	11.55	.141	541	490	3,327.82
17	33	Chilled iron (M.C.B.)	164,510	72,370	114,590	1,948,030	20.29	15.74	.137	674	607	267.58
5	34	Cast steel	183,247	123,031	162,309	811,545	47.804	45.37	.2795	539	486	226.85
13	36	Cast steel	262,062	173,776	214,520	2,788,760	57.008	53.72	.2504	730	657	698.36

Reboring 101-B Motor Frames for Oversize Housings

By E. F. Whitney

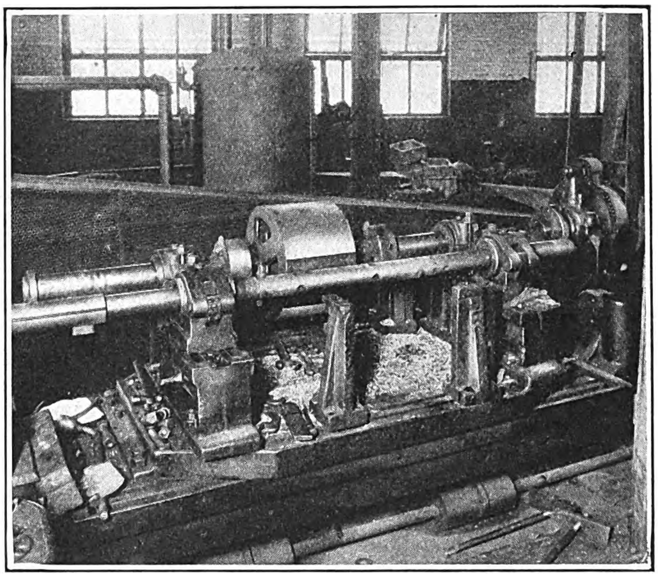
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

Split Type Motors to the Number of 1,200 Are Being Rebored by the Brooklyn-Manhattan Transit Corporation so as to Use New Through-Bolt Housings—Special Jigs and Fixtures Reduce Cost of the Reboring Operation

REBORING of Westinghouse 101-B split-type motor frames for new through-bolt housings and oversize axle bearings is now being carried out by the Brooklyn-Manhattan Transit Corporation according to a regular program. Approximately 1,200 of these motors, which have been in service for nearly twenty years, are to be rehabilitated.

The reboring is done on a two-spindle horizontal boring mill such as is used by the motor manufacturer in boring the frames. The wear which has occurred on these frames is chiefly around the housing fit at the axle bearing seat and split of the axle cap. The motors which are to be rebored are dismantled completely and the frames are sent to the welder. The gear case support arms which are cracked or broken off above the axle bearing are thermit welded and thereby reinforced. The inside and outside faces of the housing seat are welded to enable the housing seat to be machined to the original width. This seat, which usually is worn considerably, is not welded, since each frame is being rebored for ¼-in. diameter oversize housings. Were standard housings to be used the housing seat could be electric welded and then rebored to standard size.

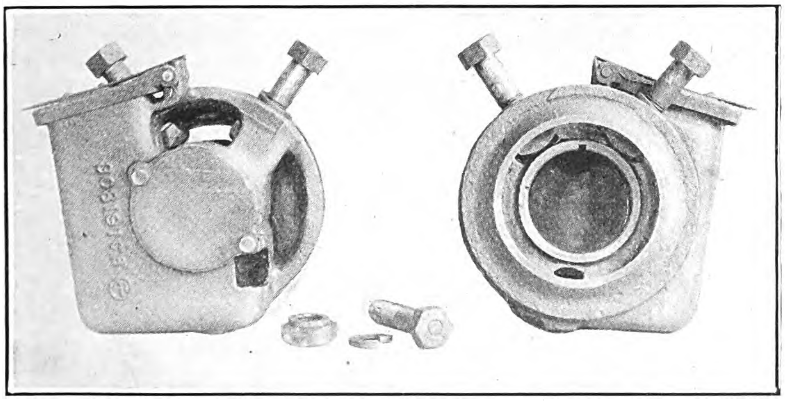
The axle-bearing seats are being rebored ⅛ in. larger in diameter than the original size. If standard axle bearings were to be used it would be necessary to weld the entire axle bearing seat in the frame before reboring. The bores of the axle caps are not welded, but a slight cut is being milled off the split so that the ⅛-in. oversize bore can be made. This procedure is particularly desirable if the axle caps are of malleable iron, as difficulty usually is experienced in machining this material after it has been welded.

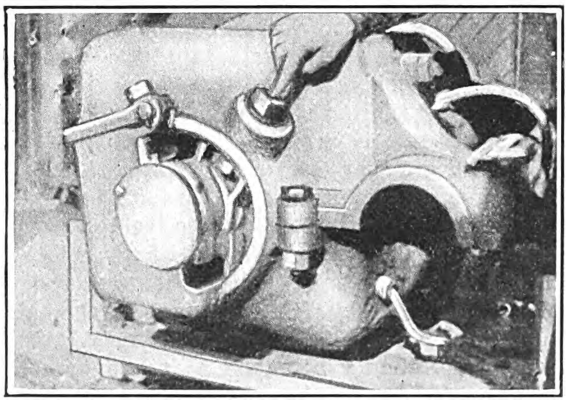


The Motor to Be Rebored Is Assembled on a Drum Which Is Carried on a Boring Bar of a Two-Spindle Horizontal Boring Mill

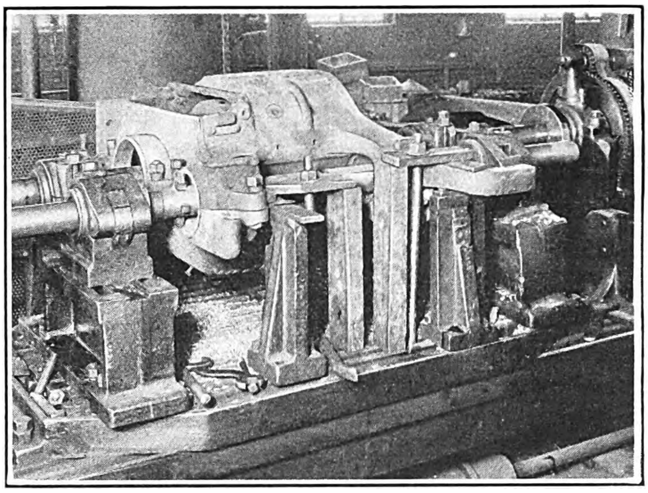
The time spent in welding and machining these frames is being held to a minimum. Slightly worn parts, such as gear case pads, bolt holes and the parting surface of each frame, are not being welded and machined. The outer face of each axle-bearing seat, which is the part of the frame and axle cap adjacent to the flange of the axle bearing, is merely faced off without attempting to keep the standard dimensions. This is satisfactory since the axle caps are not interchanged. In the latter event the faces would have to be welded and machined to standard dimensions.

The two halves of the frame are clamped to a drum which is shown in place on the horizontal boring mill





At Left, Type of Through-Bolt Housing Used with Revamped Split Frame Motor. At Right, Bosses Are Welded on the Motor Frames for the Through Bolts



In This Illustration the Motor Frame Has Been Assembled on the Drum in the Boring Mill

in an accompanying illustration. The drum is fitted with bushings and mounted permanently on the boring bar. Running clearance between these bushings and the boring bar is not over 0.005 in., as it is desirable to make the bearing seat bore as accurate as possible and at the same time keep the air gap uniform. The four pads attached to the outside of the drum have been turned to the exact diameter of the pole seats. This drum is clamped between the four pole seats. Extra shims are used at the parting, near the frame bolts, to compensate for the wear of the split. With the shims in place and with the frame bolts drawn tight, the minimum clearance at various places around the frame parting is approximately 0.017 in. Without this clearance the frame will have little clamping action on the housing and difficulty will be experienced in keeping the housings tight.

The frame with the drum and boring bar is set in position in the boring mill. The boring bar toward the front of the picture is left in the boring mill and the axle caps are put on after the frame is set up. Sufficient clamping action of the axle cap is obtained without using shims when reboring the axle-bearing seats, but if the standard motor practice is to be followed shims with a total thickness of 0.017 in. should be used. The drum acts as a support and partially centers the frame in the boring mill. It is necessary to adjust the height of the axle side of the motor frame so that the center of the boring bar is $\frac{1}{8}$ in. above the axle cap parting. The two boring bars should be fitted in their bearings with little excess clearance and should be spaced the distance apart required for the type of motor being rebored. With the frame set up and the axle side clamped to the boring mill table the reboring can be done very quickly.

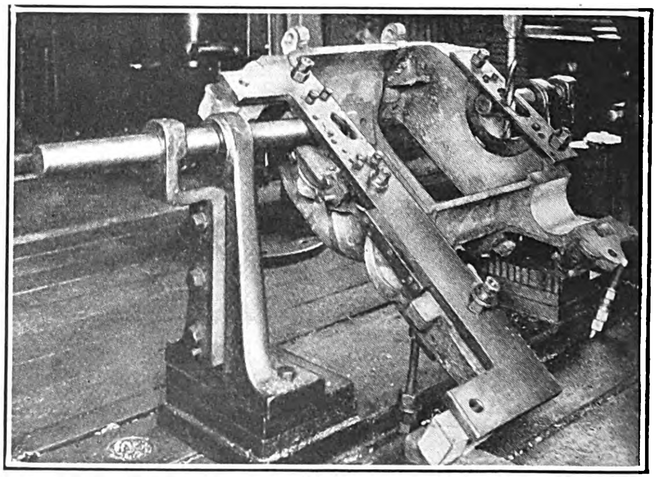
The main boring bar, which is used to rebore the housing seats, is provided with two tool heads. The other boring bar carries its own tools. A skilled mechanic, using both boring bars at the same time, can do very accurate work. Suitable inside micrometers are desirable for gaging the finished bores while the frame is in the boring mill. The housing seat bore should be from zero to 0.005 in. oversize and the axle cap seat bore within ±0.002. The inside and outside housing seat faces should be made so as to give a tight fit between the two flanges of the housing. The over-all distance between the outside flange faces should be held within $\frac{1}{64}$ in., as this affects the end play of the armature. The axle-bearing seat faces are machined and gaged from the housing seat faces.

ADAPTING MOTOR FRAMES FOR THROUGH-BOLT HOUSINGS

The 101-B type motors were originally equipped with cast-iron tap-bolt housings, each held to the upper frame by one vertical tap bolt. These have been a source of trouble with the cast-iron housings. The new housings are $\frac{1}{4}$ in. diameter oversize and are designed to use two radial through bolts and nuts in place of the tap bolts. The new housings are made commercially of either malleable iron or cast steel. They are interchangeable with the original tap-bolt housings.

In order to adopt the practice of using the two radial through bolts for the 101-B motors it is necessary to weld two bosses to each end of the upper frame. In the illustration showing a 101-B motor assembled with the through-bolt housing the shopman is pointing to one of the through bolts. Directly underneath the bolt head is one of the bosses welded to the end of the motor frame. The bosses are steel pieces shaped so as to fit the frame. Their diameter is about 3 in. It is preferable to weld the bosses in place before any reboring is done, since there may be some distortion of the frame while welding. Inspection holes in the frame back of these bosses are closed up by welding thin plates on the inside, so as to obtain clearance for the housing bolt head. Additional clearances, if desired, can be machined when drilling and spot facing the bosses. Each boss is spot faced after drilling to provide a seat for the housing bolt head. The jig consists of a semicircular ring about the width of the housing seat and of the same diameter less 0.005 in. The ring has a flange which is clamped against the inside housing seat face. The cross piece with the elongated hole, shown in an illustration, is bolted to the frame. The cross-piece for the pinion end may be extended and bushed for drilling the bolt holes in the two gear case support arms. Each jig has two hardened steel bushings in the half ring located radially on a 35 deg. angle so that the holes in the housing and frame bosses will line up when assembled. By supporting the frame on two pedestals, as shown, it is possible to tip and block the frame at the desired angle so that the drill will enter the bushing without binding.

With the set up as described for reboring, it is not necessary to mill off the parting surface of each frame, even though it may have become somewhat worn, or to rebore the pole seats. This eliminates any necessity



Holes for the Housing Bolts and Gear Case Are Drilled with the Aid of These Jigs for making a change in the brush-holder pads. When the frames are assembled each housing should fit tightly in the frame. High grade bolts should be used to clamp the axle caps and frame together. These bolts should be drawn up tightly and evenly so as to give the desired clearance between frame halves and to avoid any distortion of the frame which would cause misalignment of the armature bearings.

The time required to do the necessary welding, reboring and other work on axle caps is equivalent to approximately one day. The work is comparatively simple and inexpensive if the necessary jigs and shop facilities are available. The expenditure for rebuilding these motors and putting them in good operating condition will undoubtedly be repaid many times by lower maintenance and better service. When remachined and fitted with new housings, bearings and other parts these motors are practically equal to new ones and should give satisfactory service for several more years with decreased maintenance costs.

Systematic Records Reduce Line Failures

Every Failure of the Overhead on the Toronto Lines Is Recorded—A Study of These Records of Troubles and Locations Where Trouble Occurs Are Followed Up with Inspection and Replacements — Delays to Traffic Have Been Reduced Materially as Defective Parts Are Not Allowed to Remain in Service

By J. F. Neild

Electrical Engineer Toronto Transportation Commission, Toronto, Canada

MATERIAL reduction in failures of the overhead structure has followed the inauguration of a plan for keeping systematic records of failures. This work was started following the reorganization of the operating forces when the street railway system of Toronto was taken over by the Toronto Transportation Commission in September, 1921. This entire plan has been developed on the assumption that the trolley wire, together with its possible effect on power supply, can cause more interruptions to traffic than any other single cause except a total power interruption.

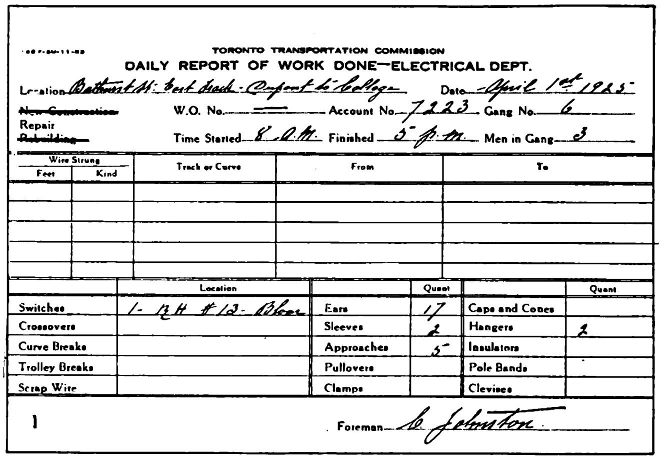
The Toronto street railway system has some 225 miles of No. 00 trolley wire, of which 157 miles is alloy and 68 miles hard-drawn copper. The suspension is $\frac{7}{16}$-in. seven-strand galvanized wire with lock hangers and 15-in. ears. There are feed taps or equalizers every 500 ft. All spans on iron poles have triple insulation, while those on wooden poles have double insulation. Porcelain insulators are used on all new construction.

The city is divided into sections on the basis of car mileage rather than wire mileage, but as all parts of the system have from four to five minute headway with a 200 per cent increase on the morning and afternoon peaks, the whole city has to be treated as a heavy traffic proposition. Each section is in charge of a foreman, who has one inspection truck with a three-stage power hoisting tower and swing table. This is manned by two first-class linemen and a chauffeur. This foreman is in charge of all the construction and maintenance work in his section. Of course the gangs are pooled when necessary to handle any large job. This gives a very flexible organization of small size which is always occupied.

As the inspection proceeds all necessary repairs are made and the wire is realigned. Approximately every three months the entire system is gone over completely. Except for natural depreciation its condition is kept practically as good as new. Long stretches of worn trolley wire which require renewing are listed, a schedule of renewals made out and the wire renewed during the cold weather. In this way the trolley wire is strung at maximum tension with minimum sag and the temperature strains take care of themselves. As the normal variation of the temperature of the wire ranges about 120 deg. F. in Toronto, these frost strains must be given consideration.

ACCURATE RECORDS ARE KEPT

Each day a memorandum of the day's work is made out. This gives the charge number and form (Fig. 1) for each job of the previous day's work. The memoranda are sent to the chief clerk, who checks the charges for correctness, sending them on to the cost clerk. The latter keeps a running check of the cost against the current budget. The forms finally go to the record clerk for his information. If he thinks the work important enough, he has it checked up by a junior engineer.



TORONTO TRANSPORTATION COMMISSION
DAILY REPORT OF WORK DONE—ELECTRICAL DEPT.

Location Bathurst St. East track - Dupont to College Date April 1st 1925
~~New Construction~~ W.O. No. — Account No. 7223 Gang No. 6
Repair
~~Rebuilding~~ Time Started 8 a.m. Finished 5 p.m. Men in Gang 3

Wire Strung		Track or Curve	From	To
Feet	Kind			

	Location		Quant		Quant
Switches	1- RH #13- Bloor	Ears	17	Caps and Cones	
Crossovers		Sleeves	2	Hangers	2
Curve Breaks		Approaches	5	Insulators	
Trolley Breaks		Pullovers		Pole Bands	
Scrap Wire		Clamps		Clevises	

1 Foreman C. Johnston

Fig. 1—The Work Done Each Day Is Reported on This Form

Every frog, crossover, and curve replacement is recorded as shown by Fig. 2, and every piece of wire, even down to a length of 2 ft., is recorded as shown by Fig. 3. This gives an accurate knowledge of the wear and tear of every part of the system. Incorrectly located frogs show up very quickly; curves which are not properly offset are known in a very short time and are corrected.

In order to facilitate records and to insure that re-

At	Part	New	Ren.	Ren.	Ren.
3	L.H. switch	11-24-24			
4	R.H. "	11-24-24			
5	L.H. "	10-13-22			
6	R.H. "	9-15-22			
7	L.H. "	9-15-22	2-7-24		
8	R.H. "	9-28-22	9-21-23	2-1-24	1-6-25
9	R.H. "	11-24-24			
10	L.H. "	10-13-22			
12	L.H. "	9-15-22	1-31-24		
13	R.H. "	11-24-24			
14	L.H. "	10-11-24			
15	R.H. "	10-11-24			
19	Crossover	11-24-24			
20	"	9-28-22			
23	"	11-24-24			
24	"	11-24-24			
25	"	9-15-22	6-19-24		
26	"	10-11-24			
27	"	10-11-24			
28	"	9-28-22	6-19-24		
29	"	10-11-24			
30	"	10-11-24			
31	"	10-11-24			
32	"	10-11-24			
		New	Mat.	Ren.	Mat.
CD	Curve Wire	11-24-24	112′ Br.		
EF	" "	10-13-22	98′ Cd.		
GH	" "	9-15-22	102′ Cd.		
LM	" "	11-24-24	95′ Br.		
NO	" "	9-15-22	86′ Cd.		
PQ	" "	9-28-22	89′ Cd.		

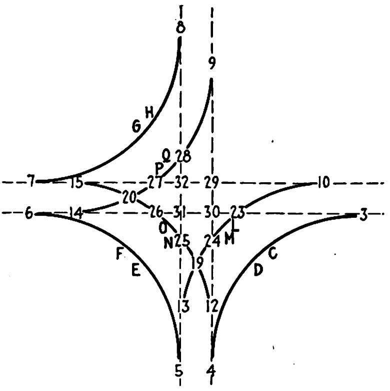
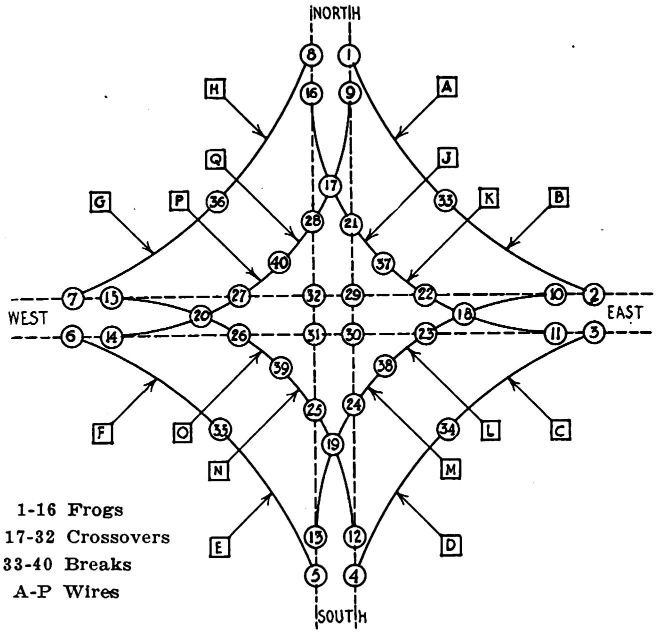


Fig. 2—Every Replacement Is Recorded, as Shown in This Record of Replacements at St. Clair and Yonge Streets. The Original Form Contains Eleven Columns for Renewals



Report all overhead work as follows, giving date, location, material and quantity:
Bathurst & Dupont—Curve—A. B., New Wire
80 Ft. Cadmium—No. 2 R. H. Switch
Bloor—North Track—From No. 2 Switch at Avenue Rd. to Third Pole West of Yonge Street 1,500 Feet H. D. Copper.

Fig. 4—A System of Numbering and Lettering Parts at Intersections Simplifies Record Keeping

ports from the traffic department shall be accurate, we have developed a system of lettering and numbering the various parts of an intersection, as shown in Fig. 4. Every traffic inspector has a copy of this chart. Excellent results are obtained because the actual frog or crossover which is giving the trouble is definitely indicated in the report.

ORGANIZATION OF OVERHEAD DEPARTMENT

In Toronto the relative number of overhead emergency calls per month is considered as a barometer. The variation shows quite clearly the condition of the wires. While it is necessary to watch construction and maintenance work closely, the electrical engineer finds it desirable to study the emergency trouble reports with the greatest care, in the interest of traffic.

The Toronto Transportation Commission has one emergency department to which are sent emergency calls of all kinds. These calls are received by a clerk who is responsible for dispatching the proper gang (way, rolling stock or overhead) to take care of the trouble. The overhead emergency department has a standard truck and crew, the same as a maintenance gang. When they are sent out they are expected to make permanent repairs in every case where it is possible to do so in a reasonable time.

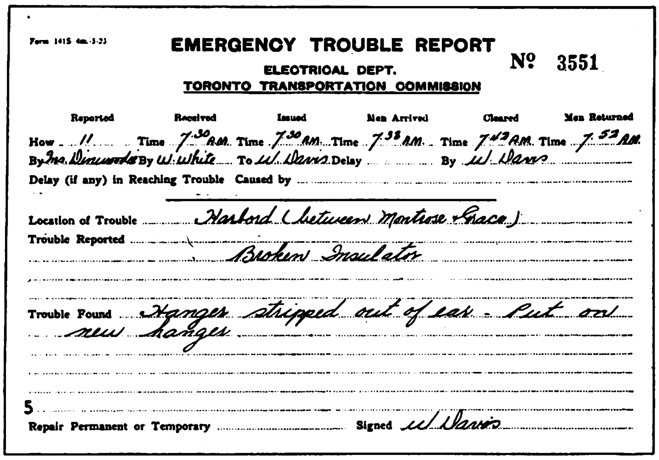
Every telephone message of any kind sent into the emergency depot is logged and kept for reference. In

Locatfon..ST. CLAIR Ave.

Lengths of 100 Ft. and Over						
Date	Class	From	To	Wire	Kind	Feet
21, Dec. 23	New	Caledonia............	60′ E No. 43..........	N	HD	220
22, Sept. 15	"	No. 7 at Yonge........	West to Tr. Br.........	N	Cd	300
Sept. 15	Ren.	21′W No.10 at Vaughan	1 PE No. 10 at Vaughan	N	Cd	105
23, Apr. 2	"	1 PW Parkwood.......	1 PE Poplar Plains.....	N	Cd	1,572
Sept. 1	"	2 PW Avenue Rd......	16′ E No. 6 at Ave. Rd..	S	Cd	357
Oct. 16	"	30′EIPE Caledonia....	West to Caledonia.....	N	Cd	105
Oct. 16	"	2PW Wychwood.......	3 PE Wychwood.......	N	Cd	365
24, Feb. 19	"	1 PW Bathurst........	East to Bathurst......	N	2nd	120
Feo. 26	"	1 PE McRoberts.......	2 PE McRoberts.......	N	2nd	120
May 19	"	1 PE Greensides.......	1 PW Parkwood.......	N	HD	5,477
May 20	"	1 PE Greensides.......	2 PE St. Clarens.......	N	HD	5,313
May 21	"	25′ EIPE Caledonia....	2 PE St. Clarens.......	N	HD	1,501
May 21	"	50′ EIPW Caledonia...	1 PE Westmount......	N	HD	3,521
May 22	"	2 PW Wychwood......	1 PE Westmount......	S	HD	4,810
May 23	"	2 PW Wychwood......	1 PW Poplar Plains....	S	HD	5,417
June 5	"	1 PE Poplar Plains.....	10′ E No.15 at Ave. Rd.	N	HD	596
June 5	"	1 PW Poplar Plains....	1 PE Forrest Hill......	S	HD	362
Oct. 11	New	1 PW Yonge..........	2 PW Avoca Bridge....	N	HD	1,078
Oct. 11	"	1 PW Yonge..........	2 PW Avoca Bridge....	S	HD	1,078
Oct. 29	"	2 PW Avoca Bridge....	2 PE Avoca Bridge....	N	HD	1,021
Oct. 29	"	2 PW Avoca Bridge....	2 PE Avoca Bridge....	S	HD	1,021
Nov. 1	"	2 PE Avoca Bridge....	Mt. Pleasant Loop.....	N	HD	862
Nov. 1	"	2 PE Avoca Bridge....	Opp. Mt Pleasant.....	S	HD	862
Nov. 7	"	Opp. Mt. Pleasant.....	East end of Loop......	S	Br.	67
Nov. 18	Ren.	2 PE Avoca Bridge....	5 PW Avoca Bridge....	S	HD	1,372

Short Lengths				
Date	Location	Wire	Kind	Ft.
22, June 16	1 PW Vaughan.....	S	2nd	5
June 16	1 PW Vaughan.....	N	2nd	5
23, Sept. 27	1 PW Vaughan.....	S	2nd	42
Oct. 10	No. 43 at Caledonia	S	Cd	45
24, Feb. 28	No. 23 at Wychwood	S	2nd	54
Feb. 28	No. 3 at Bathurst...	S	2nd	45
Oct. 11	1 PW Yonge.......	N	HD	20
Nov. 18	1 PW Mt. Pleasant	N	HD	97
Dec. 12	40′ E Caledonia....	N	Ph	75

Fig. 3—Wire Replacements Are Recorded to Show Length, Location and Date. This Is the Record for a Portion of the Line on St. Clair Avenue



Form 1415 4m.-3-23

EMERGENCY TROUBLE REPORT № 3551

ELECTRICAL DEPT.

TORONTO TRANSPORTATION COMMISSION

Reported	Received	Issued	Men Arrived	Cleared	Men Returned
How 11	Time 7^{30} A.M.	Time 7^{30} A.M.	Time 7^{38} A.M.	Time 7^{43} A.M.	Time 7^{53} A.M.
By Mrs. Dinwoodie	By W. White	To W. Davis	Delay	By W. Davis	

Delay (if any) in Reaching Trouble Caused by

Location of Trouble Harbord (between Montrose & Grace)

Trouble Reported Broken Insulator

Trouble Found Hanger stripped out of ear - Put on new hanger

5

Repair Permanent or Temporary

Signed W. Davis

Fig. 5—Emergency Troubles Are Logged and Kept for Reference on a Standard Form

case the call has reference to trouble on the overhead lines the record is made on the form shown in Fig. 5. This form is known as the emergency trouble report (E. T. R.). When it is filled in, it tells the whole story of the emergency call. Complete records for the day are sent to the head office by 9 o'clock the next morning. Then they are tabulated and sent out to the various departments interested, so that by 10 a.m. the part played by the overhead department in the previous day's traffic delays is known.

All these overhead emergency calls are spotted on a map which is inspected regularly by the superintendent of the department. If any location has more than two calls per month a special inspection is made so as to forestall the development of any serious trouble. Each month a new map is started and the previous month's calls are tabulated under 21 headings in a report showing the calls for the corresponding month of the previous year and cumulating both years up to the month of the record. This gives a definite comparison of the general condition of the overhead system.

When a trolley wire is broken a report is made on the form recommended by the American Electric Railway Engineering Association on page 692 of the 1924 proceedings.

Each break is investigated by an engineer. If at all possible, a definite cause is determined and the condition corrected. If the break shows any peculiar fracture a photograph enlarged to 20 diameters is made and studied. An analysis of these breaks made at the end of the year is interesting and instructive. It is an excellent guide in planning future work, as it indicates in what direction action must be taken to improve conditions.

Charting the record in the form of a running curve, as shown in Fig. 6, indicates clearly that these methods have materially reduced the potential delays to traffic that are due to the overhead lines. Our experience shows that in order to obtain such a reduction we must have an accurate knowledge of what is happening, and immediately take steps to remedy any condition found to be faulty.

All costs are checked. They are held to an authorized budget set out for the year by months. The items are divided into labor and material estimates for each account number, so that the cost of any change that is made to improve the efficiency of the system is definitely known. Of course its value can be judged accordingly. The time and money spent are considered well worth while. The procedure followed has given us a freedom from annoying traffic delays which are the bane of every traffic official's existence.

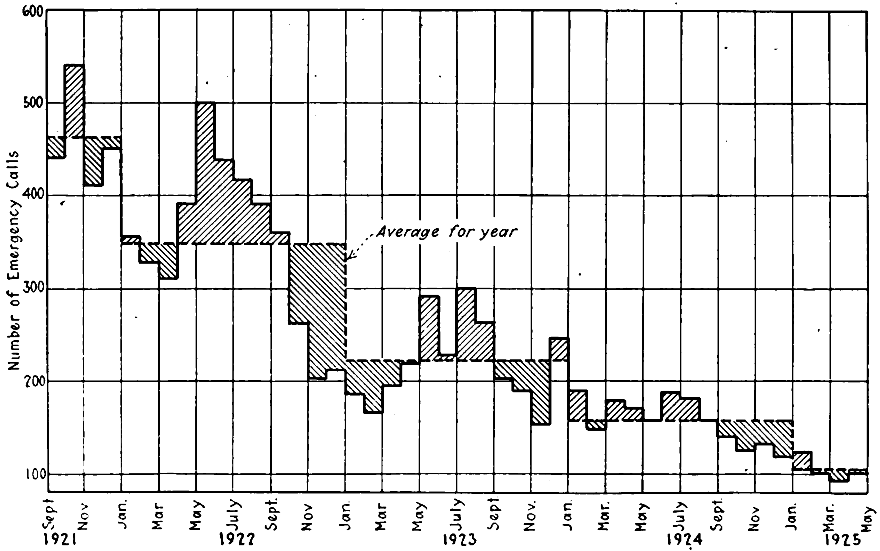


Fig. 6—Emergency Calls per Month from September, 1921, to May, 1925, Inclusive

Reducing Noise in Car Operation

Much Can Be Accomplished by Proper Design—Wear of Parts and the Sound Emitted Vary Approximately as the Square of the Clearance—Higher Standards for Fitting Parts Are Desirable to Lessen Noise

By H. S. Williams
Assistant Superintendent of Equipment, Department of Street Railways, Detroit, Mich.

MUCH of the objectionable noise produced in the operation of electric railway cars is shown by analysis of causes to be due to hammer-like blows originating between the rail and wheel. These blows may be small while the car is rolling over smooth rail or they may be heavy as when passing over special work. Whether light or heavy, they set up vibrations in the wheels which are transmitted through every portion of the car. If all parts of the car were rigidly fastened together, then the only noise possible from blows of this sort would be due to vibrations within the structure. Such a noise would be similar to the sound produced when any solid object is struck a heavy blow. The parts of a car are not solidly united, but are broken up by various bearings, springs, supports, etc. Hence the vibrations set up through the wheels tend to produce rapid motion between separated parts, causing them to strike together and produce noise. There is then a primary cause for noise due to wheel and rail contact and a secondary rattle or vibration set up by parts striking together but due to the primary cause.

It can be stated positively that noise in cars is a composite. No single remedy is applicable; rather, the solution of the problem lies in the adoption of many forms of relief, the summation of which will result in quiet operation.

Considering the first-mentioned source of noise, the possibility of reducing it lies in cushioning of parts and reduction of unsprung weight to the minimum. Cushioning is applicable and necessary to the track structure as well as to the car. It may take one of many available forms. Cushioning for cars may be obtained by the use of some form of cushion or resilient wheel, means for deadening the ringing sound of wheels such as bolted-on wood or composition blocks, means for breaking up the continuity of metal such as the interposition of pads of canvas, rubber, asbestos, or other similar material. These will tend to absorb vibration and prevent its transmission from one steel member to another. The use of a cushioning flexible surface such as headlining or steel sides may also be needed to kill the sounding board effect.

Reducing unsprung weight will reduce noise. Less sound will be generated, as the blow struck between wheel and rail will be lighter. Incidentally, reduction of unsprung weight will improve riding qualities. As a matter of fact, if the cushion wheel proves practical it will solve the problem of cushioning, as far as the car wheel is concerned, and also the problem of unsprung weight, for this type of wheel would have the effect of carrying on springs all weight except that of the wheel rims. While discussing weight, it must not be overlooked that the total weight has an important bearing. It is perfectly obvious that the lighter the car the less will be its noise in rolling over the rail.

CAREFUL FITTING WILL REDUCE NOISE

Coming, then, to the second classification of noise, or that due to the striking together of car parts that are not rigidly joined, it is believed that one broad rule applies and that its adoption will result in the minimum of sound from this source. This rule is to adopt much higher standards of construction and maintenance for all fitted parts. It is readily apparent that if two parts are loosely fitted there will be greater rattle than if they are held tightly together. For instance, a loose journal box cover is productive of much noise. If the cover were bolted tightly there would be none. Likewise, it is admittedly true that a loosely fitted bearing is noisy, while if bored to a snug fit it will be quiet. Moreover, the more clearance there is the greater will be the volume of the noise. Equipment men are beginning to realize that in the past they have been too tolerant in their practice of fitting bearings and similar parts. In nearly any railway shop clearances of 1/16 in. have been considered allowable and in many instances 1/8 in. clearances have passed inspection. Compare this with automobile practice, where clearances are held rigidly to a very few thousandths, and an idea may be obtained of how crude car maintenance practices have been.

There are two very strong reasons why higher standards of bearing fittings should be favored, first on account of noise and second on account of wear. The noise has already been discussed. As to wear, there are two forms involved, that due to friction and that due to hammering. The friction remains practically constant throughout the life of the bearing, if it be protected from dust and dirt. But if, as in the case of axle bearings on older types of motors, an end of the bearing be exposed there will be a lapping or grinding action proportional to the area of the opening or clearance. Assuming the bearing to be a true circle, if there be clearance beyond that required for the oil film, then the area of this clearance will vary almost directly as the clearance, and the grinding action will approximate this same ratio.

The wear due to hammer blows will vary almost directly as the square of the clearance. It is believed by the writer that this element of wear is of greater consequence than frictional wear. As an illustration to this refer to the first figure. This represents an exaggerated case of an axle (*A*) and its surrounding bearing surface (*B*), the clearance being shown as (*D*). Due to vibration, the bearing will move in a vertical direction to the limit of the clearance and will strike at (*E*) a blow whose value is not easily calculable. But the energy of the return blow will vary as the square of the space traveled, or, in other words, the clearance.

Since the volume of the sound is directly proportional to the energy of the blow it follows that the noise is also directly proportional to the square of the clearance. Consequently if it is desired to reduce sound to the minimum greater care must be exercised to insure accurate bearing seats. Equal care must be used in fitting bearings to them, using as low clearance as possible. In so doing noise and wear will be reduced to the minimum.

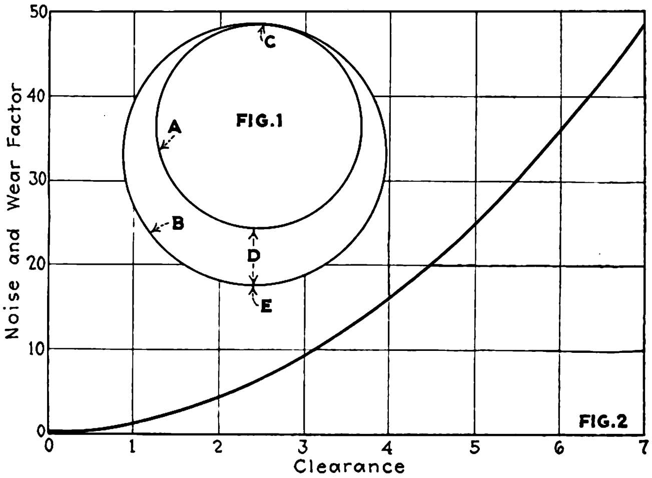
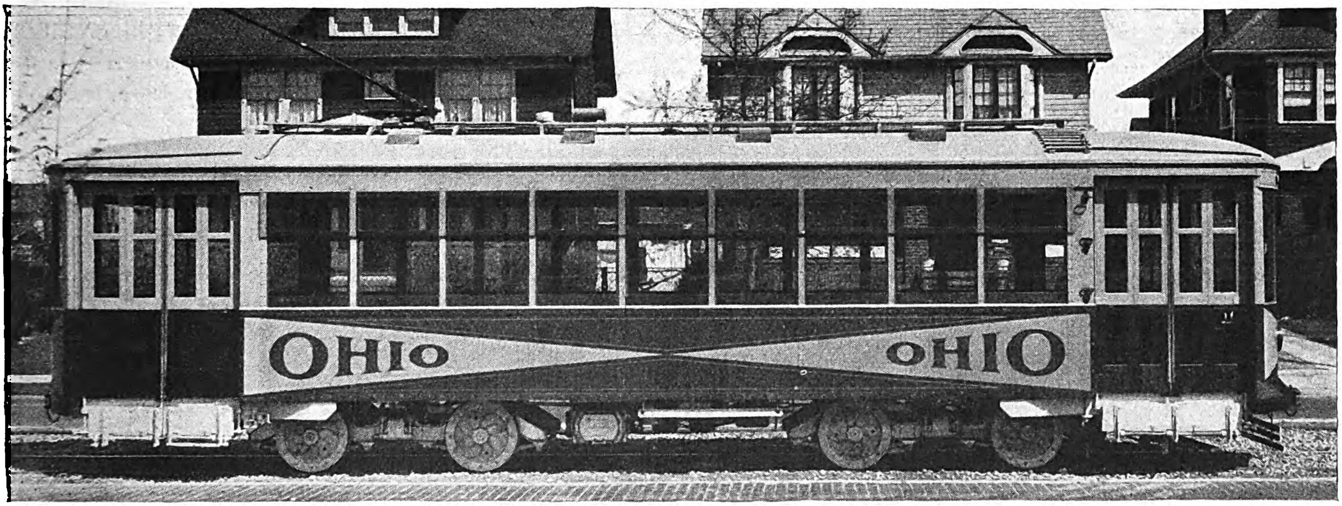


Fig. 1—Diagram Showing Excessive Clearance Between Axle and Bearing. Fig. 2—Comparative Values of Sound and Wear for Varying Clearances in a Bearing

By adopting higher standards of maintenance, which means renewals at lower limits of wear than is the present practice, the condition of quiet economical operation once incorporated in the design will be perpetuated. The economic value of this can be shown more clearly, perhaps, by the graphic method. Since wear and sound vary approximately as the square of the clearance, the relation between wear and clearance may be seen from the accompanying graph. Arbitrary values are assigned in this graph to clearance and noise, but it shows how slowly the noise factor increases during the early stages of wear and how it accelerates as wear progresses. Unfortunately tests are not available which would make it possible to assign actual values. Data are in the course of preparation and will be available at a later date.

While the above argument has been developed with particular reference to bearings, the same line of reasoning is applicable to other fitted parts.



A Stream-Line Effect Is Produced in the Kuhlman Car by Attention to the Position of the Door and Vestibule Rails

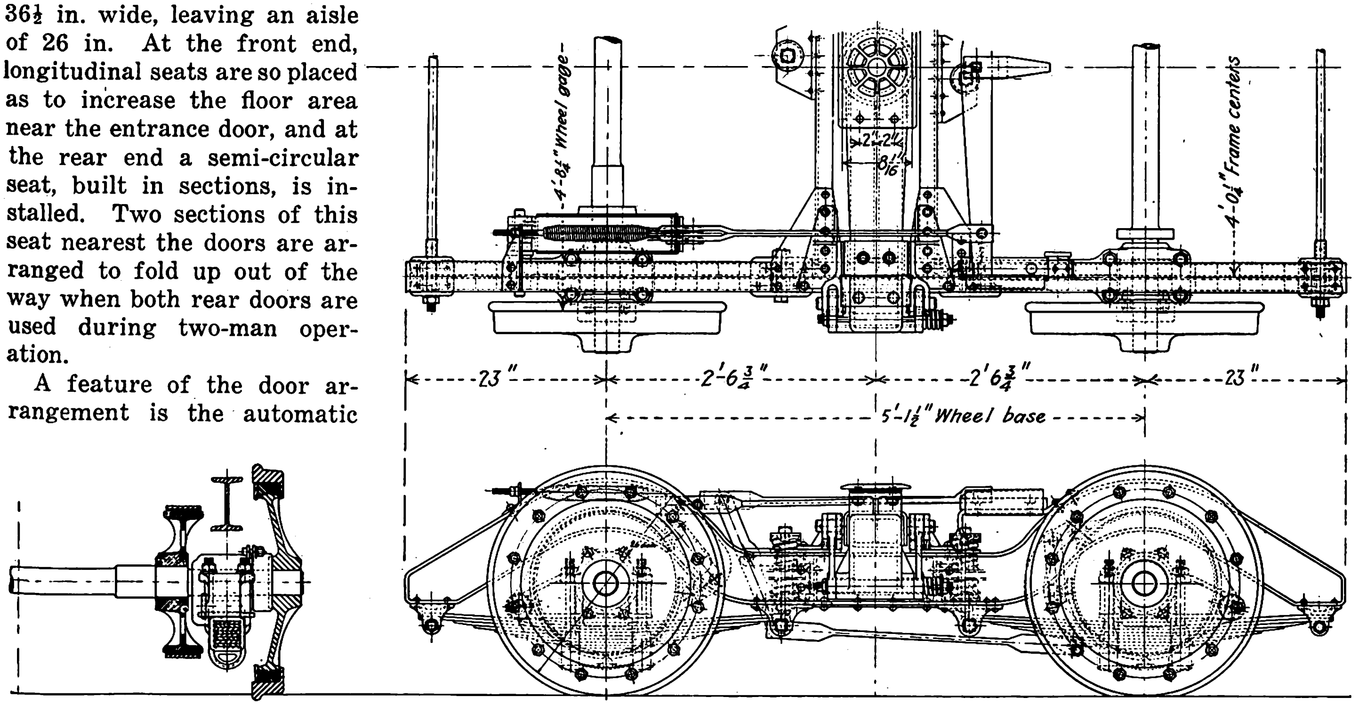
Many Innovations in Grand Rapids Cars

SECOND ARTICLE

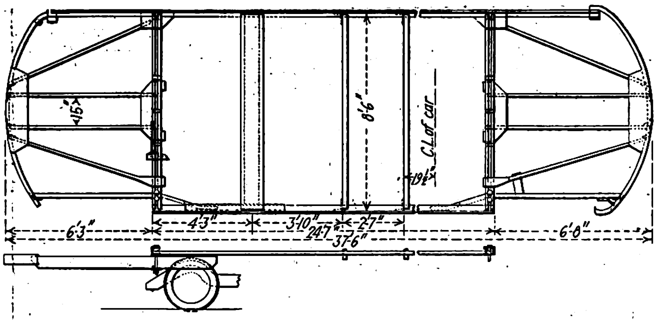
The Second Sample Car Entered in the Contest Was Built by the J. G. Brill Company at Its G. C. Kuhlman Plant—It Differs in Many Respects from the Light-Weight Noiseless Car Described Last Week and the St. Louis Car, Which Will Be Treated in an Article to Follow

MANY distinctive features are found in the Kuhlman sample car for the Grand Rapids Railway. It is similar to the two other cars in that it is single ended and is arranged for one-man two-man operation. Double folding doors at front and rear have National Pneumatic engines and control. Full Safety Car Devices Company equipment is included. The car is 37 ft. 6 in. long over all, 8 ft. 6 in. wide over the side girders and 10 ft. 9½ in. high from rail over trolley boards. The total weight is 26,400 lb. The car has a seating capacity of 43 passengers. The cross seats are 36½ in. wide, leaving an aisle of 26 in. At the front end, longitudinal seats are so placed as to increase the floor area near the entrance door, and at the rear end a semi-circular seat, built in sections, is installed. Two sections of this seat nearest the doors are arranged to fold up out of the way when both rear doors are used during two-man operation.

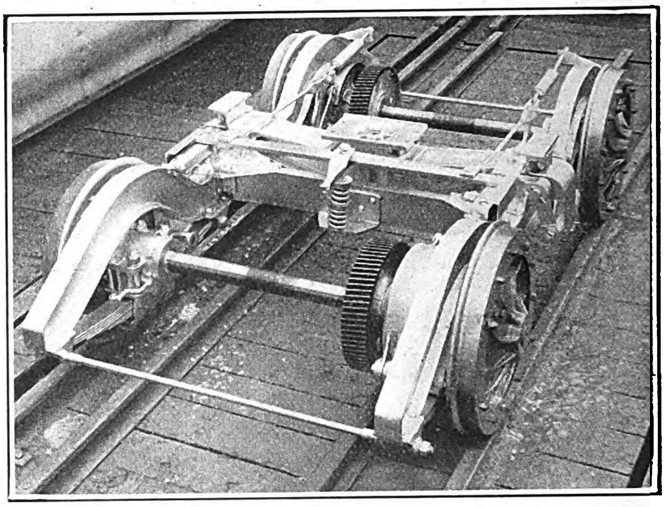
A feature of the door arrangement is the automatic treadle-operated rear exit. This permits passengers to alight from the rear end after the operator's M-28 brake valve is moved to the door-open position. The rear door closes automatically when the last alighting passenger has cleared the step, and remains closed even though a passenger stands on the treadle until the brakes are again applied and the valve is moved to door-open position. When the car is run by one man, passengers may board at the front end and may be permitted to alight at both front and rear ends. For two-man operation a conductor's position is arranged in



Details of the Truck, Showing Arrangement of Bearings, Brake Drums and Motor Fits the rear vestibule. At this point a valve mounted on an extension of a short platform rail gives the conductor control of each of the rear doors. Thus when two men are in charge, passengers may enter at the rear, pay their fares as they enter, and leave either at the front or rear ends. The arrangement also permits the car to be operated "pay leave," in which case passengers would enter at either the front or rear ends and pay as they leave at the rear end. A street fare collector's valve is mounted on the outside, so that collectors may be used at busy points in combination with one-man operation.


15"
8'6"
C.L. of car
19½"
6'3"
4'3"
3'10"
24'7"
2'7"
37'6"
6'8"

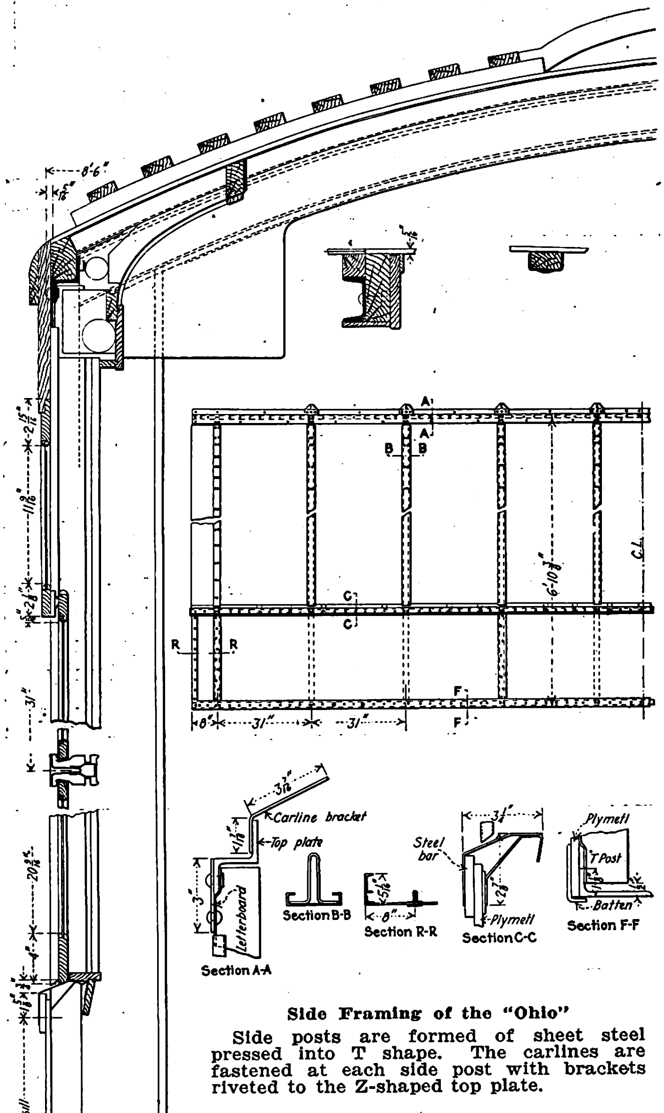
Body Bolsters Are Built Up. End Sills Are Double Channels. Platform Knees at Door Openings Are Carried Under the Side Frame



A Simple and Light-Weight Truck Is a Radical Departure from Current Designs

There is a 2-in. ramp on the vestibule floor from the center line to the doors. The body floor is 31½ in. above the rail, making the height at the door sill 29½ in. The folding step is 15 in. above the rail and the distance from the step to the platform floor is therefore 14½ in. At the front end there is a single step under both doors, as these are operated simultaneously by one engine. At the rear end, each door has a separate step. Two engines are used here, so that the automatic exit may be opened by an alighting passenger while the other remains permanently closed, unless it is being used as a rear entrance when the car carries a conductor.

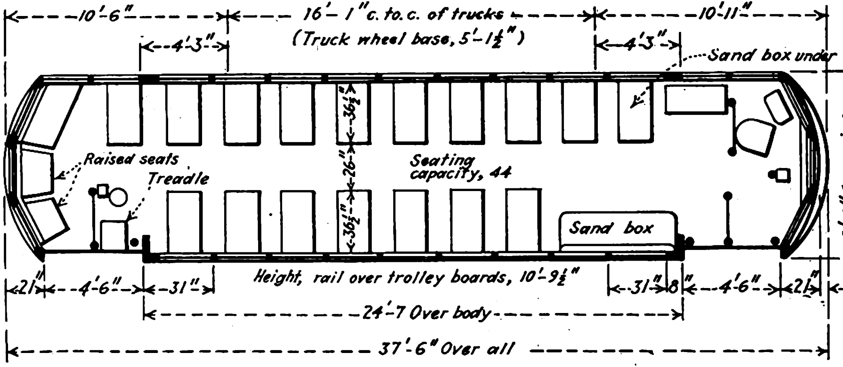
Scarlet and gray, the colors of Ohio State University, make a striking exterior color scheme. This has been put on by the Duco process. A novel pennant effect is designed to make the car distinctive and stimulate interest and comment on the part of the Grand Rapids public. The pennants are not only painted on the dash but a similar design is carried out on the side panels. A stream-line effect to improve the appearance has been sought in the construction and painting. The glass


8'6"
A
B
C
R
F
6'10¾"
C.L.
8"
31"
Carline bracket
Top plate
Letterboard
Section A-A
Section B-B
Section R-R
Steel bar
Plymetl
Section C-C
T Post
Batten
Section F-F
3"Channel Furring
2"Ramp
Top of crown piece
30⅝" To bottom of sill

Side Framing of the "Ohio"

Side posts are formed of sheet steel pressed into T shape. The carlines are fastened at each side post with brackets riveted to the Z-shaped top plate.

At Right — The Car Has a Seating Capacity of 44. The Position of the Automatic Rear Exit Door Treadle Is Shown in This Plan View


10'-6"
16'-1" c. to c. of trucks
(Truck wheel base, 5'-1½")
10'-11"
4'3"
4'3"
Sand box under
36½"
26"
36½"
Raised seats
Treadle
Seating capacity, 44
Sand box
8'-6" Over girders
21"
4'-6"
31"
Height, rail over trolley boards, 10'-9½"
31"
8"
4'-6"
21"
5"
24'-7 Over body
37'-6" Over all

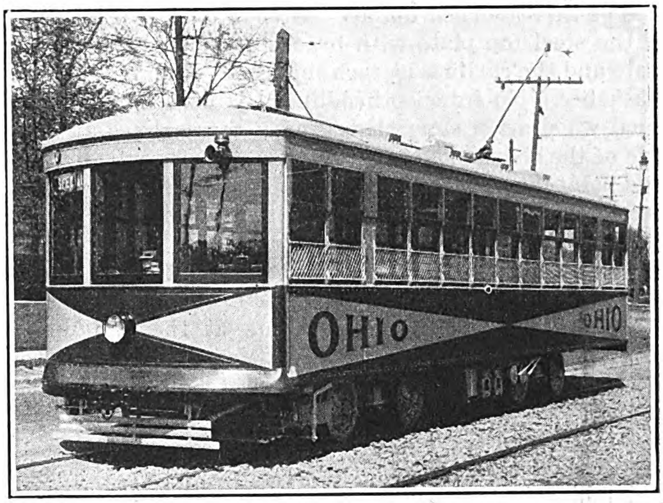
lines of the body correspond with the doors and vestibule. A departure from customary practice has been made in finishing the folding doors. Instead of painting these one solid color, or leaving them in natural wood color with a varnish finish, as is customary, the section below the center rail is painted the color of the lower part of the body, while above this point they are painted to match the upper part of the body. This accentuates the stream-line effect and gives the vehicle a trim appearance.

Four Westinghouse No. 508 motors rated at 25 hp. each are used under this car. These are fitted with Hoffman roller bearings on both ends of the armature shaft. The compressor is a Westinghouse DH-16 type.

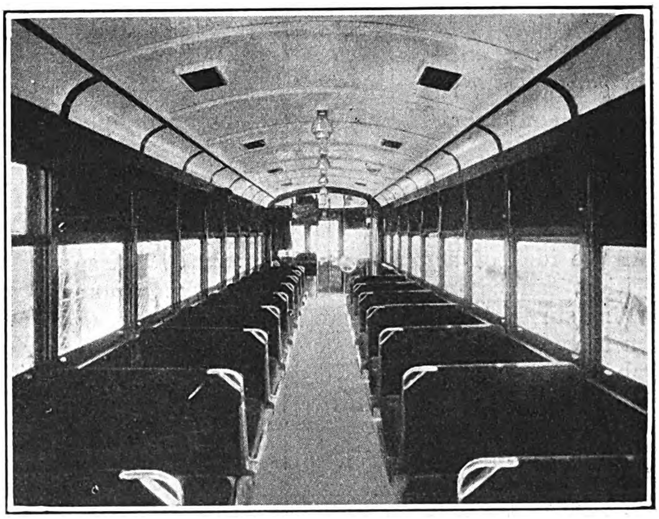
An instrument panel built across the inside of the dash covers the piping and apparatus, but this is made considerably narrower than on the two other cars. Its location is shown on the accompanying plan view. The interior finish is mahogany. The seats are upholstered in green plush and the operator is furnished a comfortable bus type bucket seat.

The special Brill 81-M trucks are a modification of the type that have been used under the Brill Model 55 gasoline rail car. The arrangement of side spring suspension approaches automotive practice. The customary pedestal construction is eliminated entirely and the inside journal boxes are carried directly on underslung semi-elliptic springs mounted in shackles on the truck side frames. These side frames are made of one-piece I-beam sections, kicked up over the axles, to give clearance for the springs. The truck bolsters hang in a pair of swing links at each end. These are carried in clevis castings bolted to the top of the side frames near the center. The ends of the bolster extend down outside the side frames, so as to permit the use of this link construction. To damp the side sway, the bolster is made long enough so that the lower ends of the links extend out beyond a vertical line through their pivot point.

As in the case of the trucks on the two other cars, fabric-lined clasp shoe brakes surround an axle drum. The 26-in. diameter wheels are an adaptation of the Mead cushion wheel for motor trucks. These have a rubber cushion between the steel tire and the cast-steel hub that is pressed on the axle.



The Pennant Effect Is Carried Around the Entire Car Body



Seats Are Upholstered in Green Plush. The Haskelite Roof and Pressed Steel U-Shaped Carlines Are Exposed

Side panels of the car body are $\frac{1}{16}$ in. thick Plymetl. This is hot riveted to the T-shaped, pressed-steel side posts. Battens are used along the bottom of the girder. At the top, one part of the pressed steel belt rail laps over the outside of the side panel, thus taking the place of a batten. There are vertical battens at the joints in the panels. The T-section side posts form the foundation for Brill renitent casings in which the mahogany side sash are mounted. Brass channels on the sash stiles reinforce the construction and take the wear in the sash grooves. On the outside, between the belt rail and the letterboard, pressed-steel caps riveted to the side posts form the outer guides for the sash.

At the top of the side posts a Z-shaped structural member forms the top plate. A flat steel letterboard is riveted over the lower vertical leg of this top plate, covering the space between the eaves and the side post caps. U-shaped pressed-steel carlines, with the open

SUMMARY OF PRINCIPAL DIMENSIONS, WEIGHT AND EQUIPMENT OF KUHLMAN SAMPLE CAR FOR GRAND RAPIDS

Type of car	Single end, one-man, two-man
Length over all	37 ft. 6 in.
Width over side girders	8 ft. 6 in.
Height, rail over trolley boards	10 ft. 9½ in.
Seating capacity	43
Weights:	
Car body	12,040 lb.
Electrical equipment	720 lb.
Air-brake equipment	1,400 lb.
Motors	4,400 lb.
Trucks and gears	7,840 lb.
Total	26,400 lb.
Armature bearings	Hoffman roller
Air brakes	Westinghouse DH-16 compressor with fabric-lined clasp-shoe brakes on axle drum and full safety car devices.
Buzzers	Faraday
Conductor's signal bell	Consolidated, single stroke
Conduit	Duraduct
Control	K-35-KK with 801-E line switch
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic with automatic treadle-operated rear exit.
Fare boxes	Woods
Fenders	H-B Lifeguards
Gears	Nuttall BP, helical
Gong	Electric Service for manual or pneumatic operation
Hand brakes	Peacock staffless
Heater equipment	Gold truss plank type
Headlights	Crouse-Hinds 10 in.
Headlining	None
Journal bearings	Hyatt roller D-215
Journal boxes	Cast steel, inside wheels
Lamp fixtures and reflectors	Electric Service opal glass
Motors	Four Westinghouse 508, 25 hp., inside hung
Motorman's seat	Brill adjustable bucket type
Paint	Duco
Power saving device	Economy meter
Rear signals	Nichols-Lintern
Sanders	Nichols-Lintern
Sash and door material	Mahogany with brass channels on sash stiles
Seats	Brill stationary
Seating material	Green plush
Step treads	Kass safety
Track scraper	Root pneumatic
Trolley catchers	Ideal No. 10
Thermostat	Gold
Trolley base	Ohio Brass, form 10
Trucks	Brill 81-M, special
Ventilators	Nichols-Lintern
Window wiper	Folberth vacuum type
Wheels	Mead cushion type, 26 in. diam., 2½-in. tread
Warning signal	Bosch Ula—6 horn

side of the U turned up, are fastened to the vertical leg of the steel top plate with brackets riveted to both the plate and the carlines at each side post. The roof is $\frac{5}{16}$-in. Haskelite. No interior headlining is used. A longitudinal wood strip runs along under the carlines at each side of the body. The advertising card racks extend from this point down to the curtain rail inside the posts. This arrangement breaks up the arch curve of the ceiling at the advertising cards, so as to form a semi-monitor appearance on the interior. A bulkhead frame at each end of the body is built up of 3-in. channel. This is arched across the roof, the joints at the two upper corners being reinforced with gussets.

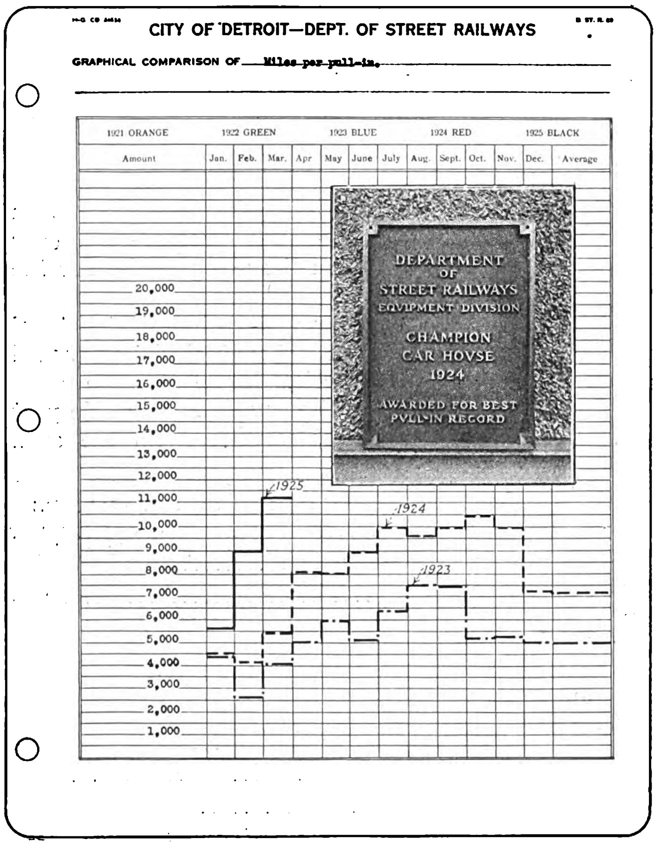
The body floor is single thickness, $1\frac{1}{16}$-in. fir, grooved in the aisle. In the vestibules, 1-in. ship-lapped maple is laid crosswise. There is no lining on the inside of the Plymetl side panels.

Combination lighting fixtures and shade holders, furnished by the Electric Service Supplies Company and equipped with opal glass shades, are spaced down the center of the car. The wiring for these lights is placed in conduit below the trolley boards on top of the roof.

A summary of the principal dimensions, weights and items of equipment is given in the accompanying table.

Spirit of Competition Decreases Pull-Ins

MEN are never too old to enjoy playing games. If the idea of a game, which means of course competition, can be incorporated into the humdrum daily routine surprising results can be accomplished, and the men themselves will get pleasure out of their otherwise drab tasks. There is little romance to the average carhouse man's work, so in order to inject more interest the Department of Street Railways, Detroit, Mich., started a pull-in competition on Jan. 1, 1924. A banner suitably lettered was given as a trophy to the carhouse with the best monthly record. This was held until the following month, when it went to the winner for that period. So, month after month, the flag was fought for with increasing interest and with a resulting consistent decrease in the number of pull-ins. The accompanying graph shows how effective the work of the men became. At the end of the year a permanent trophy in the form of a bronze tablet was promised to the carhouse showing the greatest number of monthly victories. When the final results were figured it was found that three carhouses had held the banner for three months each, so the final award had to go to the one showing the greatest number of miles per pull-in.



CITY OF DETROIT—DEPT. OF STREET RAILWAYS

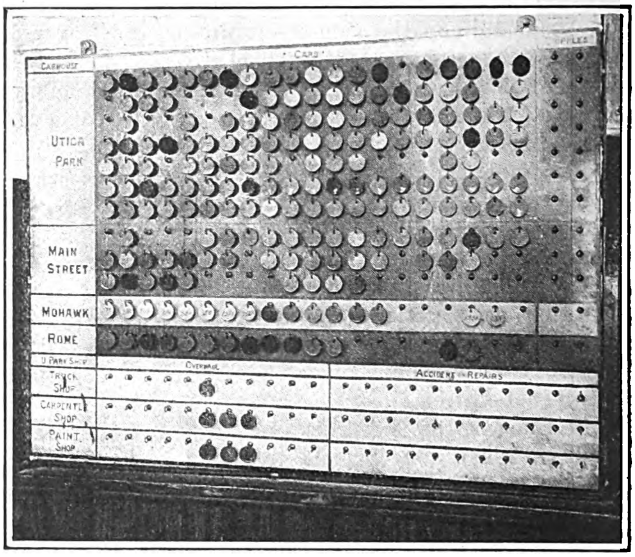
GRAPHICAL COMPARISON OF Miles per pull-in.

Monthly Pull-In Records in Detroit Are Shown Graphically on This Form. The Insert Shows the Tablet Awarded to the Carhouse with the Best Pull-In Record for 1924

Board Shows Location of Cars

FIBER tags hung on a board are used to indicate the location of cars in service on the routes of the New York State Railways, Utica lines. The accompanying illustration shows the board, which is located in the master mechanic's office at the Utica Park shops. It is 3 ft. wide by 4 ft. long.

The upper section of the board shows cars available for service in each carhouse. This section is divided into three parts, of which the one at the left gives the name of the carhouse to which the car is assigned. The center section of the board has rows of screw hooks, on which are attached the various fiber tags with the car numbers. The section at the extreme right is for "cripples." In order to distinguish readily cars assigned to one division which may be at another carhouse, four different colors are used for the tags. Brown tags are used for cars assigned to the Utica Park carhouse; red tags for the Main Street carhouse; blue tags for Mohawk carhouse, and green tags for Rome carhouse. The sections of the board opposite the various carhouses are also painted in colors which correspond to those of tags assigned to its particular carhouse.



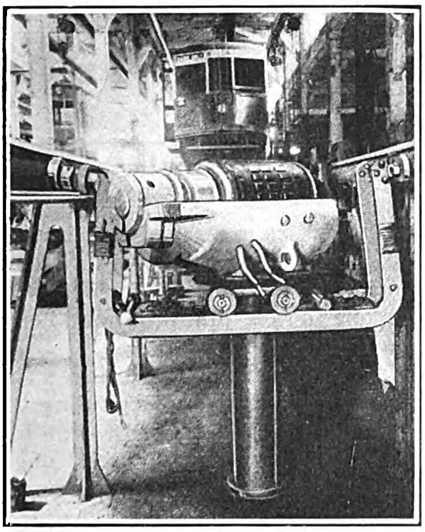
The Location of Any Particular Car Can Be Ascertained at a Glance at This Board

The lower part of the board is arranged to show cars which are in the Utica Park shops for overhauling or repairs. This section is divided into three parts, for the truck shop, the carpenter shop, and the paint shop. The classes of work being done on the cars, such as overhauling and repairs for accidents, are indicated by divisions on the board.

Equipment Maintenance Notes

Suspended Pit Hoist for Handling Motors

REMOVAL and replacement of the lower shells and armatures of split frame motors has been facilitated by a suspended type of pneumatic pit hoist. This was designed and built in the shops of the Houston Electric Company under direction of F. J. Bennett, master mechanic. The hoist also has proved useful for handling box frame motors of the smaller sizes.



This Movable Pneumatic Pit Hoist in the Houston Shops Is Carried in a Cradle Which Rides Along the Base of the Rail on Roller Bearings.

As shown in the accompanying illustration, this hoist consists of an 8-in. air cylinder with approximately a 30-in. stroke. This is carried at the bottom of a movable cradle which rides along the inside flange of the rail base on rollers which are fitted with roller bearings. The cylinder is mounted on a small cross-carriage which rides on grooved wheels supported on the crossbars of the cradle. Thus the entire hoist may be pushed along the pit by hand to any desired position. At the same time the cross carriage may be moved so as to bring the motor up to the proper place. Mounted in the top end of the piston is a small table approximately 16 in. x 11 in., which may be rotated on its supporting center bearing in the piston. Consequently, a motor may be freely rotated into any desired position while being hoisted into place.

The supporting cradle is made of two ¾-in. forged bars, formed to the proper shape and bolted to the roller brackets at the ends. The cylinder is supplied through a hose with shop air at a pressure of from 90 to 120 lb. A control valve is mounted on one side of the suspension carriage.

It will be noted from the illustration that the tracks in the Houston shop are elevated above the shop floor level on cast supporting struts. With this type of construction this form of pneumatic hoist is particularly useful for handling motors. The same idea, however, is also applicable to the usual forms of pit. Motors may readily be run out from under a car on the hoist and moved to any desired point in the shop by lifting them from the cradle with overhead cranes. It may be noted that the small rotating table allows the motor to be held in exactly the proper position for mounting on the axle of a car or truck, as soon as it had been raised high enough to clear the vertical legs of the cradle and the track.

Motor Maintenance on the I. T. S.

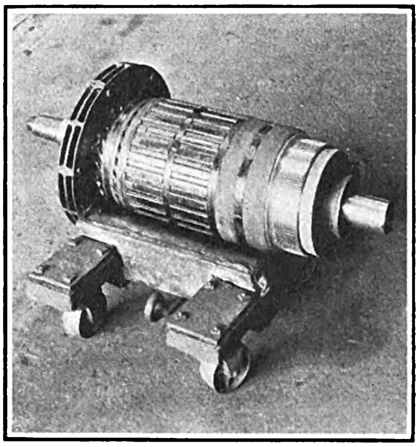
MOTOR cars which come into the Decatur shops of the Illinois Traction System for overhauling are returned to service the same day. This is made possible by having a supply of spare motor frames which can be used in case repairs require excessive time. When the truck is run out from underneath the car the motor is lifted out by the shop crane and is delivered to the motor repair department, where it is stripped of armature and field coils. The work of overhauling includes blowing off all dirt by compressed air and making repairs where necessary. In case the nose suspensions are worn they are built up by the electric welder. Worn bolts are replaced and covers are fitted carefully.

Field coils are removed and sent to the armature department for testing. If they are in good condition, they are returned and put back into the same motor. The inside of the frame is given a coat of black insulating paint. The frame heads are cleaned of all grease and dust by scraping and washing in gasoline. Oil wells are also cleaned. Brush-holders are inspected carefully, and repaired by installing new springs and other parts which are worn. Armature bearings are gaged and if worn excessively are replaced with newly babbitted bearings.

When the repairs and reassembling are completed, the field coils are given a 1,600-volt test to ground and the poles are tested for polarity to make certain that field connections have been made properly. Armatures are tested after installation for clearance from the pole faces, and the clearance of brush-holders from the commutator is gaged.

Handy Armature Buggy

FOR moving armatures about the shop and keeping them off the floor so as to prevent damage, a large number of small armature buggies are used in the Wolf Street shop of the New York State Railways, Syracuse lines. These are made with a wooden framework, which supports a cradle which is padded with canvas



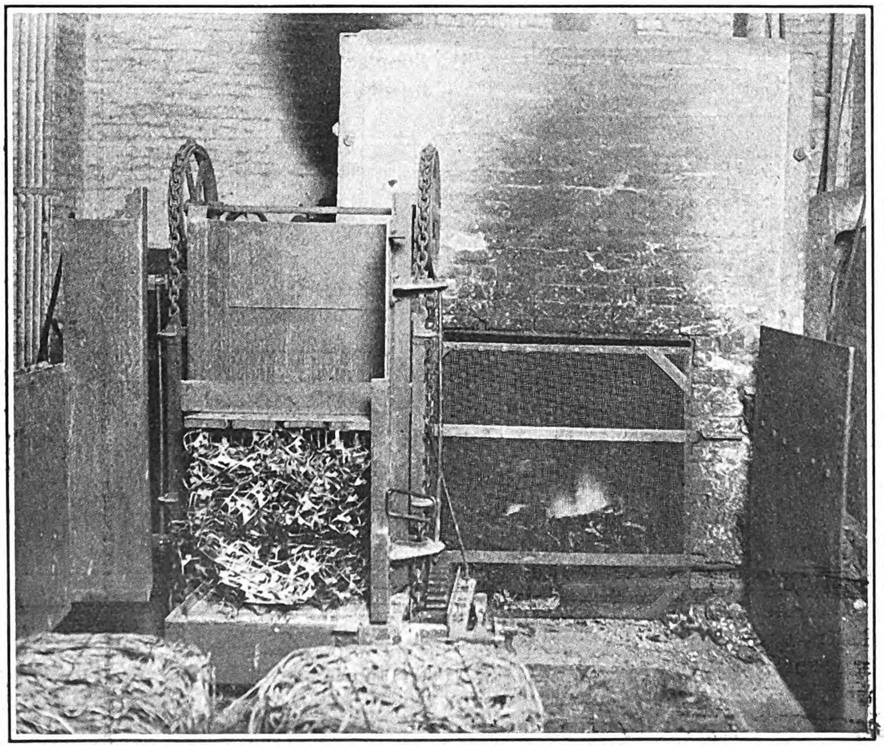
Armature Carriage Used in the Syracuse Shops of the New York State Railways to prevent injury to the armatures when they are placed in position. Four casters are bolted to steel plates above the frame. A forged-steel eye on either side of the cradle is arranged so that a handle can be hooked in for moving the carriage.

Baling Copper Scrap Makes Sale Easier

REMOVAL of the insulation from copper windings and baling of all the scrap copper has facilitated handling and resulted in more ready sales at increased prices by the Third Avenue Railway, New York, N. Y. Several large wooden bins are provided in the section of the shop where the insulation removal and baling take place. Scrap windings and other scrap copper as they come from the department of electrical repairs and also from the various maintenance shops are placed in these bins until there is a sufficient quantity for several bales.

All insulation is removed by burning. A brick furnace approximately 8 ft. square by 10 ft. high has been installed in one corner of the section devoted to this work. A flue leads to the chimney and there is an opening in the front 3 ft. square for throwing in the material. In order to make certain that other refuse and waste materials are not thrown into the furnace while insulation is being burned from copper windings, a screen is provided to protect the opening. Whenever burning is taking place without an attendant this is locked shut. A sheet steel door to provide for closing the opening to the furnace entirely is also provided.

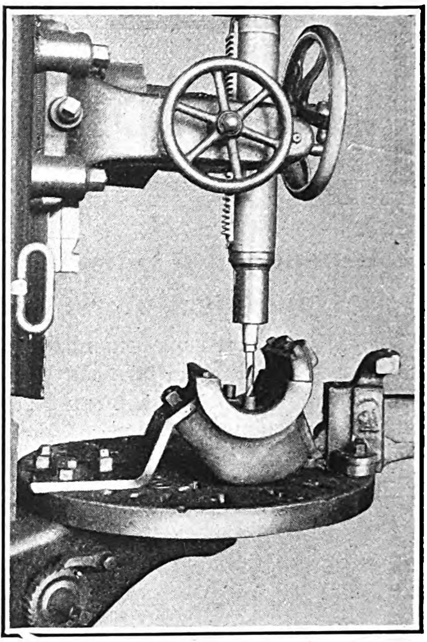
After the insulation has been removed all scrap copper is baled in a press made by the Economy Baler Company, Ann Arbor, Mich. This press produces cubical bales approximately 30 in. on a side and weighing 300 lb. The copper scrap is placed in the baler with the movable pressure platform in the raised position. When filled, pressure is applied to lower the platform and compress the scrap by a combination gear and chain drive. Removal of the scrap from the bins and placing and burning it in the furnace are done by a man with other duties on regular day work. The baling, however, is done on a piecework basis, at the rate of 50 cents per bale.



Baling Press with Front Open. The Furnace for Burning Insulation from Copper Is in the Background. Two Bales of Scrap Copper Ready for Removal Are in the Foreground

Drilling Dowel Holes in Axle Caps

ONE-HALF of an axle bearing is used to form a jig for drilling dowel pin holes in axle caps at the Utica Park shops of the New York State Railways. The practice is to use two dowel pins for holding axle bearings. Some types which have keyways worn excessively are having two dowel pins installed while others which originally were provided with but one dowel pin are now being provided with two.



Bearing Used as Base of Jig for Drilling Dowel Holes in Axle Caps

The axle bearing used for a jig has two bushed holes for guiding the drill. The cap is clamped to the bed of the drill press by a special angle bracket which holds it in correct position so that the dowel holes will be located correctly. The use of a standard bearing for the body section of the jig insures correct fitting when bearings are once installed.

Maintaining Destination Signs in Los Angeles

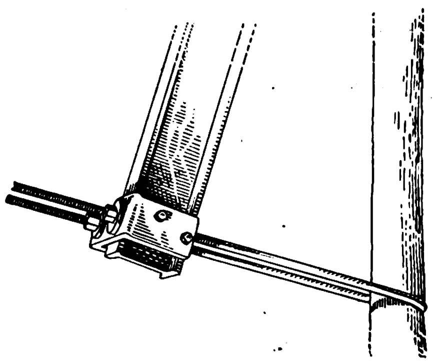
SIGN maintenance on the Los Angeles Railway, Los Angeles, Cal., is carried out at the South Park shop under the supervision of Harry P. Koster. There are 4,726 metal dash signs in use on the system, and the maintenance of these is quite an item. In some cases a car has to carry eight dash signs for use on different trips, because it operates to various terminals. Signs are available for special runs to the principal crossovers.

These signs are maintained by the silk screen method, silk bolting cloth attached to a wooden frame being used. The cloth is treated with a composition of thick black varnish. When this is dry the desired lettering is outlined on the cloth, and the black varnish is carefully scraped away with a knife to remove the composition material so that the letters are outlined on the fabric of the silk, forming a stencil. This stencil is placed on a frame with four swinging supports, pivoted at the bottom to the bench and at the top to the sides of the frame. Blank metal plates are placed at both ends of the table, and the stencil is arranged so as to fall on the particular plate to be lettered.

Yellow paint is put on the screen and is rubbed across the lettering with a squeegee in the manner described in ELECTRIC RAILWAY JOURNAL for Dec. 15, 1923. When one plate is lettered, the frame is swung to a plate on the other end of the table and the operation repeated. In this way from 160 to 200 dash signs are turned out daily.

Pole-Straightening Device

BENT and twisted tubular poles were straightened recently by the line department of the Market Street railway, San Francisco, Cal., through the use of a rather simple device. A 7-ft. piece of 107-lb. Trilby rail served as the principal member. This was fastened to the pole at one side of the bend by means of a U-clamp, without removing the pole from the ground. Due to the bend in the pole, the other end of the rail projected out from the pole a distance depending on the amount of the bend. A longer U-clamp was used at this end and a steel plate with nuts served as the clamping medium. This is shown in the illustration. By screwing down the nuts, pressure was produced sufficient to straighten the pole. By this method 150 poles were straightened at a cost of but $3.54 each. As one new pole would have cost about $50, there was a saving of approximately $7,000. In addition, labor of removing and resetting poles was not required.

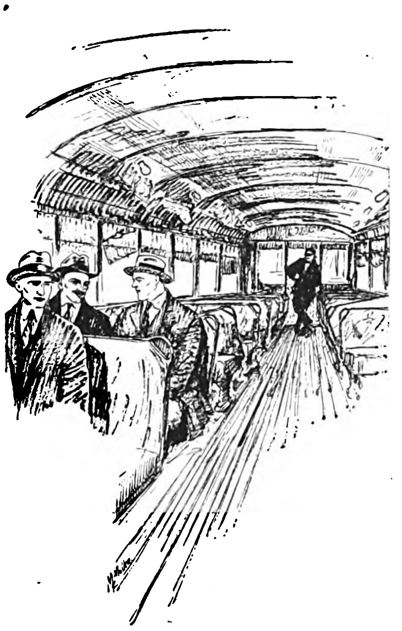


Method Used for Straightening Tubular Poles by Means of a U-Clamp in San Francisco

Dick Prescott Rides the Interurban

And Does Some Thinking

DICK PRESCOTT, engineer of equipment, and Steve White, carpenter shop foreman of the Consolidated Railway & Light Company, soon discovered what the Rushburg storekeeper had meant by saying that he didn't envy them their ride on the interurban to Trackton, the next stop on their trip of inspection. After visiting the large Rushburg property, Dick had planned on riding the Rushburg, Trackton & Middle Valley Electric Railway to Trackton in order that they might get any possible suggestions offered by the interurban equipment or service, during the next and last leg of their trip.



They took the street car to the point where the storekeeper had told them they could catch the interurban. Alighting at the lonely corner, which was on an unpaved street, they looked around to see where they would board the car.

"Where does the car stop, anyway?" growled Steve. "Think they might have put up some sort of a sign."

"Guess it stops over here where the city car did," replied Dick. "But they might at least mark the spot."

Looking at his watch, Dick saw that it was then ten minutes past time for the interurban to come. "They don't seem to care much about keeping the line on time, do they?"

"It's a different management from the one that runs the Rushburg lines, you know," replied Steve.

Just then the car came lumbering up and stopped in a cloud of dust—but on the opposite side of the street. They grabbed their bags and ran across to the car, the impatient conductor holding one hand on the bell cord and beckoning to them with the other.

"Whew!" exclaimed Dick in an undertone to Steve as they joined the two lonely looking passengers that were already aboard when they swung on. "Gee! what a smelly car!"

"Smells like the morning after the night before," replied Steve.

"My, that odor of stale tobacco and smoke certainly could have been eliminated by a good scrubbing and airing. They've probably had this car standing out there in the yard all shut up waiting for the afternoon run, just as it was after being swept out last night."

They settled themselves in a seat. Both Dick and Steve noted the badly dilapidated appearance of the car. When it got well under way they unconsciously raised their voices above the low undertones in which they had been speaking, as the rattle of windows and creaking of the age-worn car body made conversation increasingly difficult.

"I don't see how a road with this kind of equipment can hope to attract passengers," finally remarked Dick, above the clatter and squeaking. Then to his chagrin he was aware that he had spoken loud enough for the passenger in front of them to overhear the remark. This man, apparently a resident of the district, was quick to volunteer a reply.

Glancing back over his shoulder at the two friends, he said, "This road would'a been dead long ago if it depended on its passenger business. They go after freight tooth and nail, but they don't seem to give a damn about passengers." "How far is it to Trackton?" asked Dick by way of changing the subject.

"'Bout 40 miles."

"Thank you very much."

After a few minutes of general conversation about weather and crops the stranger lost interest and again resumed his attempt to read a newspaper. As they continued along, his remark was confirmed as they passed several freight trains on the opposite track.

"I think they made a mistake in neglecting their passenger equipment," said Dick, cautiously resuming his conversation with Steve. "Even though freight is their big end, shippers get a poor impression by seeing dilapidated looking passenger equipment. In addition to that the opinion of the whole community is based on the road's passenger service. They certainly can't operate these cars without suffering in the eyes of the district they serve and in the opinion of the very shippers whose freight business they are trying to develop."

"You bet," replied Steve; "the steam roads learned that a long time ago."

"Well, we'll be in Trackton before long. One day there and then we're ready to start home."

"Back to home and Tom Mullaney," replied Steve.

At this mention of Thomas Mullaney, general foreman of the Consolidated Railway & Light Company, and the immediate superior of Steve and Dick, the two travelers lapsed into silence as they watched the moving panorama of rural scenery through the dusty car window.

Signal Failures in Chattanooga Still Decreasing

CAREFUL maintenance of signals, which has been a feature of operation of the Tennessee Electric Power Company for several years, has resulted in a further decrease in interruptions to service from signals. The accompanying table gives a comparison for the years 1923 and 1924. Previous annual maintenance reports for these signals were published in ELECTRIC RAILWAY JOURNAL for March 19, 1921; March 18, 1922; Feb. 10, 1923, and March 1, 1924.

There are 42 Nachod signals in service, and during the past year there were but 66 instances of trouble. During this time the signals totaled 2,044,680 movements. This is a rate of one failure for each 30,980 movements, and the record shows an improvement of 3.3 per cent over the previous year.

During 1923 a portion of the signals and relays were overhauled and converted to the latest model. Trolley contactors for more than half the signals were painted and adjusted. The result is reflected in the record for last year. Many of these signals were installed sixteen years ago and have been in continuous service. The change to one-man operation made by the railway makes the signals more necessary than ever.

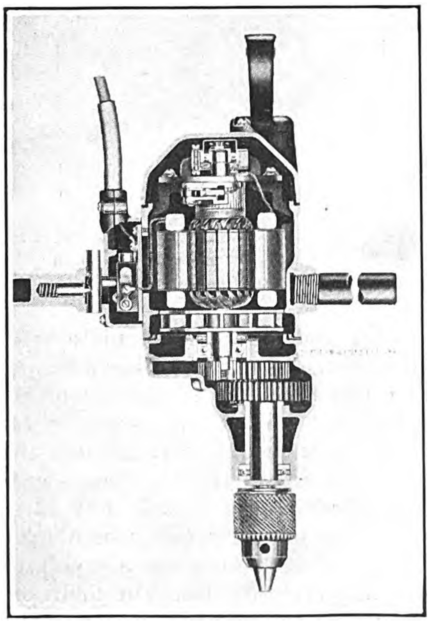
COMPARATIVE RECORD OF SIGNAL INTERRUPTIONS ON LINES OF THE TENNESSEE ELECTRIC POWER COMPANY, 1923–24

Trouble Found	1923	1924
Line wires	2	6
Fuses blown	15	7
Lamps out	8	10
Relay trouble	13	11
Setting contactor	4	5
Clearing contactor	4	1
Bad ground	6	7
Pole wiring	6	8
No trouble found	3	5
Miscellaneous	10	6
Totals	71	66
Number of blocks in service	21	21
Total yearly operations of all signals	2,124,680	2,044,680
Number of operations per failure	29,928	30,980
Average daily operations per block of signals	276	266
Average yearly operations per block of signals	101,174	97,746

New Equipment Available

Half-Inch Electric Drill

HOLES up to ½ in. can be drilled in steel with a new type of electric drill which is being marketed by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The machine has a net weight of 17 lb. and runs at a speed of 525 r.p.m. without load. New features in the motor construction have been introduced so as to add more iron and copper than previous designs. The armature is hand wound and of the toothed type. This insures uniform magnetic flux distribution.



This Universal Drill Has a Capacity Up to ½ In.

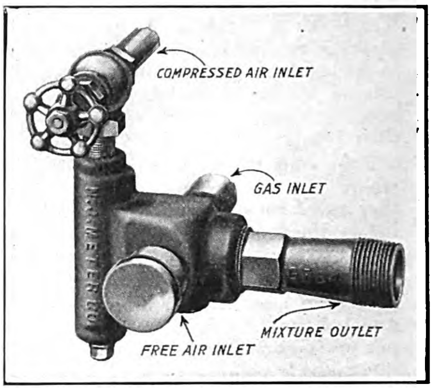
Brush-holders are provided with adjustable spring tension and are mounted as a separate unit on bakelite yokes. This permits ready adjustment when necessary. A ventilating fan mounted on the armature shaft is held in place by a key so that it cannot work loose. The cool incoming air passes over the commutator and through the motor. An improved vent construction is added to insure protection against accidental or willful abuse. The inner races of the ball bearings on the armature shaft are locked so that they cannot slip. The gear end bearing is mounted with a floating fit in a hard cast-in sleeve to prevent binding and reduce friction.

The machine is provided with side handles which can be removed for close corner work. A spade handle is also arranged on top directly in line with the drill chuck. This eliminates side pressure, reduces friction and produces a saving in drill bits. This spade handle can also be removed for work in close quarters and pressure can then be applied directly on the end cover casting.

Gas Furnace Blower

UTILIZING the principle of the injector, a new type of gas furnace blower has been put on the market by the New Jersey Meter Company, Plainfield, N. J. This blower, known as type GFB, has a screen chamber, jet nozzle and blast tube similar to the type FB forge blower made by the same company.

The intake to the blast tube, however, is inclosed and provided with two inlets, one for free air and one for gas. By this means the blower uses a small amount of compressed air at the jet and induces about 90 per cent of the air required. It also creates a suction on the gas, so that any desired quantity of gas can be drawn from the line, regardless of insufficient gas pressure.



The Injector Principle Is Used to Draw in Atmospheric Air in This Gas Furnace Blower

The air is regulated by a needle valve which controls the entire supply, both direct and induced. The gas supply is regulated by the usual gas valve. The volume of mixture, or intensity of the fire, and the proper proportion of gas and air are therefore controlled by the air valve and the gas valve, the same as in the ordinary system. The mixture pressure can be regulated from ½ in. of water column for low temperature work up to 7 in. or 8 in. water column, giving the maximum rate of combustion for treating high-speed steel, etc. It is claimed that the cost of compressed air is only 10 per cent as much as when all of the air required is taken direct from a high-pressure line. There is no chance of air backing up into the gas line, as the gas always enters and mixes with the air at a pressure slightly below atmospheric.

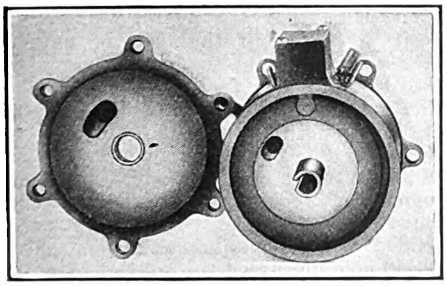
The gas furnace blower is made in three sizes. For ¾-in., 1-in. and 2-in. sizes of outlet pipe these will deliver a mixture of from 50 to 500 ft. of gas per hour.

Valveless Air Compressor

OMISSION of the usual inlet and outlet valves and other interesting points feature a type of air compressor developed by John Milne, New York City. It is arranged to operate at high speed without flywheel, piston, crankshaft or pulley. The outlet ports function as check valves and do not register except when the gas or air is ready for discharge.

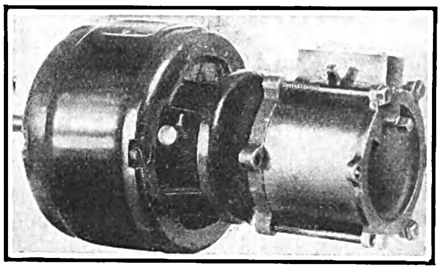
The machine consists of a cast-iron cylinder divided into two parts by a hollow partition. The hollow space is used for cooling by air or water. The circular parts on each side of the partition serve as compression chambers. Inside the cylinder are mounted an eccentric, a ring and a sliding non-rotating guide. The eccentric fits inside the ring, and the latter is guided by the sliding guide, which is located in the upper portion of the cylinder. As the eccentric is rotated the ring closes in on the inner wall of the cylinder.

At the start of a cycle a space between the ring and the inside of the cylinder is connected to the intake port. As the eccentric is rotated, the ring is thrown around so as to force the air or liquid to the opposite side of the cylinder, where compression takes place with further rotation. Compression continues until the outlet port registers, when the compressed air or liquid is discharged. The sliding guide not only maintains the ring in position but also serves to seal the outlet port and separate it from the inlet opening.



Rotary Compressor with Cylindrical Cover Removed, Showing Method of Operation

This new type compressor is compact and is composed chiefly of circular parts which are simple to construct. No coupling is required, since the unit is driven directly from the motor shaft, and no speed reduction is necessary. The operating or working portions consist of but three moving parts per unit. These are all inclosed within the cast-iron cylindrical chamber. Any number of units can be placed together to increase the capacity of the compressor. It is claimed that in operation the compressor is practically noiseless and vibrationless and that its weight and size are approximately one-third of those for reciprocating types of compressors. With the two-chamber arrangement, the compressed air or fluid from one chamber may be stepped up in the other to any pressure within the limits of compressor practice. Additional units may be mounted so as to perform separate functions if desired; thus two could be used for air and two for fluid, or one set could be used for compression and the other for producing a vacuum. The capacity of this type of compressor will range from ¼ cu.ft. to 10,000 cu.ft. and can be operated at speeds from 350 to 3,600 r.p.m.



Compressor Mounted Directly on Motor Shaft

General Purpose Motors

WITH the marketing of a new type of direct-current motor and a redesigned type of alternating-current motor, the General Electric Company, Schenectady, N. Y., is now manufacturing a completely revised line of "general purpose" motors. This line includes all standard speeds and horsepower ratings for use on any standard circuit. Some of the smaller direct and alternating-current motors, rating for rating, are mechanically interchangeable. The use of steel-shell babbitted bearings has been extended to cover all general purpose motors. While strongly advocating the use of sleeve bearings on its motors, the manufacturer has also made provision to furnish ball bearings if desired.

The redesigned alternating-current motors designated as KT-500 supersede the Kt-300 line. These motors are for use on polyphase circuits and are made in two types of rotor construction, the squirrel-cage and the wound-rotor design. Standard power ratings range from 5 to 200 hp. The squirrel-cage motors bear the designation KT-500, and the wound-rotor type, MT-500. All are of the skeleton frame type, both horizontal and vertical.

The redesign of the alternating-current types provides larger shafts and bearings, larger oil rings with lower oil level and larger oil reservoir capacity. The oil ring is retained in its slot by a guard permanently attached under the bearing screw. Other improvements include the use of spring oil well covers and improved insulation in the small, closed slot frames. The improved insulation, now included as standard on smaller sizes, makes these motors suitable for operation in places where special atmospheric conditions are encountered.

The new direct-current motors include both constant and adjustable speed machines. The bi-polar type bears the designation BD and the four-pole motors are designated as type CD.

The BD type are two-pole machines made in sizes from ½ to 3 hp., 1,750 r.p.m., and the CD type are four and six-pole, running from 3 to 200 hp. Speeds used are 1,750, 1,150 and 850 r.p.m., these corresponding with full-load speeds for General Electric 60-cycle induction motors. Thus the motors are interchangeable as far as speed is concerned, and this feature also applies mechanically to some extent to the frames used in the BD line. These direct-current motors are made for use on standard circuits of 115, 230 or 550 volts.

As a result of these changes, the standard lines of general purpose motors are much simplified. Alternating-current motors include the KT, MT and SCR types, the SCR, KT-900 and MT-900 machines having been introduced during 1923. All KT motors utilize the squirrel-cage rotor and are constant-speed machines for use on polyphase circuits. The MT machines are also for use on polyphase circuits, are constant or adjustable-varying speed, and utilize the wound rotor. Single-phase motors are covered by the SCR type, these being constant-speed machines ranging from ½ to 10 hp. The new BD and CD motors comprise the complete direct-current line.

An outstanding advantage is the standardization of renewal parts, particularly bearing linings for alternating-current types, both single and polyphase, thus enabling motor dealers to supply bearings for either alternating or direct-current motors from the same stock.

Association News & Discussions

Many Prominent Speakers at Southwestern Convention

During a Busy Four-Day Session, Southwestern Utility Men Were Treated to a Program Rarely Equaled in Sectional Association Meetings—Railway Section Program Covered Many Subjects of Current Interest

RAILWAY men of the Southwest joined the other utilities of that section in the 30th annual convention of the Southwestern Public Service Association, which was held at Houston, Tex., May 5-8. Both in the size of the attendance and in the prominence of the speakers who took part the meeting marked an epoch in the affairs of the Southwestern Association and indicated the growing importance of the utility industry in that section.

In a forecast of the development and application of electrical science, Gen. Guy E. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, painted an inspiring word picture of the ultimate part which utilities may be expected to play in the affairs of mankind, providing the dead hand of bureaucracy and governmental interference does not dam the rising tide of research and enthusiasm. President J. N. Shannahan of the American Electric Railway Association outlined the modern conception of public transportation service and asked the co-operation of the Southwest in helping the American Association and its new manaaging director, Lucius S. Storrs, to unite the industry into a closely knit organization for handling national problems. Mr. Shannahan's paper appears elsewhere. Similarly, H. C. Abell, president American Gas Association, described the status of that branch of the utility industry and the service being rendered by its national organization.

Besides the combined sessions at which these significant addresses were made, sectional meetings of various technical divisions were held each day. At the railway section meetings papers on a variety of subjects of timely interest were presented and discussed frankly and fully. Some of the papers of most general interest to railway men are abstracted elsewhere in this issue. These include a paper on labor-saving equipment in trackwork by E. S. Meyers, New Orleans; a paper by W. W. Holden, San Antonio, on the use of buses in city service and a report on current collecting devices by L. E. Delf, Fort Worth, and G. F. Tongue, Dallas. Results obtained in the operation of treadle-controlled car doors in Dallas were described by G. I. Plummer. V. W. Berry, Fort Worth, presented a paper on the type of street car which may be expected in 1930.

Papers were also read by H. B. Hearn, Shreveport, and Alves Dixon, El Paso. Mr. Hearn's subject was publicity. He used the biblical injunction "Let your light shine" as illustration of the early understood necessity for publicity. Failure on the part of electric railway managements to continue the publicity which attended the promotion and building of early lines, he said, is largely responsible for the failure of the public to understand modern changed conditions. Although he expressed approval of the printed word as an effective publicity agency, he advocated increased attention to the training of employees in direct sales work with the public.

NEW ACCIDENT CLASSIFICATION URGED

Mr. Dixon treated the classification of accidents. He showed that present methods of classifying them fall far short of giving the information needed to determine either the detailed causes or to assist in preventing future recurrence of similar accidents. As an illustration of the confusion resulting from an analysis of accident records on the basis of the present classification, he cited the example of a derailment. He showed that an accident listed under this head might be caused either by defective track, defective equipment or carelessness. He further explained that the classification "collisions with automobiles" would show exactly the same state of affairs on the records if a given number of street cars ran into standing automobiles as if the same number of automobiles ran into standing street cars. Since it is impracticable to subdivide different kinds of accidents to a point which would eliminate such inaccuracies, he advocated a basic classification to show the following grouping: (1) Man failure (employee), (2) equipment failure (company), (3) man failure (public). He cited the experience of the El Paso property in progressively reducing accidents from 1,767 in 1921 to 611 in 1924 as an illustration of the improvement which can be made by basing accident prevention work on a careful study and analysis of the conditions encountered.

Practically all of the papers were actively discussed. One general comment made by Mr. Shannahan to the railway section was that most operators have too great a tendency to confine their attention to operating their individual properties, without looking around to see how similar situations are being handled elsewhere. He said that through Mr. Storrs every member of the industry will now have available a research agency which will enable him to draw on national experience for guidance in the solution of local problems which may develop after having been encountered before in several other sections of the country.

The meeting of the railway section was opened by a short address from C. J. Kirk, supervisor of utilities city of Houston, who said that the friendly relations between the city administration, the utilities and the people of Houston was attributable largely to the care that was being taken to avoid misunderstanding on the part of any of the interested parties. Such misunderstanding, he said, is largely responsible for most of the difficulties that arise between a utility and the public which it serves. He maintained that it is very important to empower local railway managers with sufficient authority to enable them to settle all local questions. He expressed himself as being opposed to the paving burden on electric railways, and also heartily indorsed the principle of a single combined transportation agency to serve all the needs of a given city.

USE THE ASSOCIATION FACILITIES

Covering at some length the subject of co-operation between the national and sectional associations, J. W. Colton, editor *Aera*, outlined some of the services which the national association is prepared to render and urged that the association headquarters in New York be made the clearing house of information for the industry. Chairman Wood commented that the average operator hesitates to admit the need of advice or assistance from the parent association because of a feeling that such action is an admission of inability to handle individual problems on his property. He said this results frequently in an attempt to defend individual practice instead of seeking the benefit of the experience of others who have contended with a similar situation. Mr. Wood also discussed the subject of publicity which had been treated in Mr. Hearn's paper. He said that the information given the public must not be limited to the things that reflect credit on the railway management. To win public confidence, he insisted that all information in which the public may be interested, whether favorable or otherwise, be made available. Another sidelight was thrown on this subject by Richard Meriwether, vice-president and general manager Dallas Railway, who said that effective and sincere publicity can help matters only after the affairs and service of the railway have reached such a state that there is no hesitation in telling the whole story. Good service, he insisted, is in itself the best advertisement, and until this is really being rendered publicity will be of no avail. In using newspaper space, he advocated a complete and carefully worked out campaign prepared in advance as a necessary step toward getting the desired results from the money expended. Mr. Berry described briefly some of the practices in Fort Worth and advocated continuous effort toward the enlightenment and education of employees. J. P. Griffin, vice-president and general passenger agent Texas Electric Railway, Dallas, Tex., outlined some of the publicity methods used by his company for building long-distance interurban business.

TROLLEY SHOES AND WHEELS

The report on current-collecting devices, which was a comparison of results obtained with sliding shoes and trolley wheels, raised considerable active discussion. Mr. Berry pointed out that the reduction in costs as shown in the report were not all due to the use of sliding contact shoes, but were in large measure attributable to a higher standard of inspection and maintenance which reduced service failures. He also said that the cost of ears and sleeves has not decreased materially with the adoption of sliding contactors. The wear on the entire overhead system is greater, he contended, when both wheels and shoes are used than when the sliding type contactor is used exclusively. The opinion of those taking part in the discussion seemed to be that the most important objection to the use of shoes in city service where single-end cars are used is the difficulty of backing around Y's.

Some observations on the effect of shoes on trolley wire wear were described by C. L. Greer, superintendent overhead construction Galveston-Houston Electric Railway. He found that the wear produced by shoes in high-speed service is comparatively small, but that this condition does not hold near stations or other stopping places where cars slow down and start up. He showed samples of trolley wire less than eighteen months old that had been heavily worn at slow speed points on the line, while the remainder of the wire showed little effect of wear. He maintained that fittings last a shorter time with slide contacts than with wheels, but that the slide is very much superior to the wheel from the standpoint of dewirement.

A general round-table discussion of this subject of contact devices developed many views of the relative merits and limitations of slides and wheels. It was pointed out by those who had obtained favorable results with the slides that greasing of the trolley wire is an important factor in reducing wear, and also that wear is materially increased if wheels and shoes are both used on the same wire. G. H. Clifford, vice-president and general manager Northern Texas Traction Company, Fort Worth, and Mr. Meriwether both summed up the situation by pointing out that the question resolves itself finally into one of service, and that cost is of small importance compared with the maintenance of uninterrupted service. To this end, increased attention is being directed to overhead inspection so as to eliminate potential troubles and interruptions before they occur. This results in linemen spending their time inspecting the overhead system and making replacements as they are required, rather than answering emergency calls to repair broken lines.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 19-22 **— Chamber of Commerce of the United States, annual meeting, Washington, D. C.**

May 20-21 **—Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.**

May 25-26 **—Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.**

May 25-28 **—National Association of Purchasing Agents, Milwaukee, Wis.**

May 27-28 **—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.**

June 2-4 **—Central Electric Railway Association, French Lick Springs, Ind.**

June 3 **—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

June 3-4 **—Iowa Electric Railway Association, Waterloo, Iowa.**

June 10-12 **—Canadian Electric Railway Association, Montreal, Quebec.**

June 26-27 **—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

July 22-25 **—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

Oct. 5-9 **—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

BUS-OPERATING RESULTS

The paper by Mr. Holden on bus operation inspired considerable discussion and brought forth a comparison of bus policies in San Antonio and Houston. Mr. Wood said that the Austin bus line in Houston, charging an average fare of 6½ cents and carrying a heavy traffic on a comparatively short route, had earned $13,000 above interest, depreciation and operating expenses during the past year, but that other routes covering greater distances at this rate of fare have shown a decided loss. He contended that a minimum bus fare of 10 cents is necessary to make bus operation pay its own way on the average route in Houston. He described an interesting plan to furnish bus service to a new high-grade residence district on a basis where those interested in obtaining the service underwrite the operations, but explained that one of the important factors in this proposed arrangement was the length of contract and the form of bond required to guarantee the permanance of the line without danger of future loss to the company through being forced to continue an unprofitable service upon discontinuance of the original guarantee contract. He stated that the objective in instituting bus service in Houston was to make this service self-supporting and to develop it as an auxiliary, preferred, deluxe service in comparison to existing rail lines.

Mr. Holden described the failure of shuttle or feeder lines in San Antonio and also told about a plan for using the bus as a high-fare express vehicle in connection with a real estate development enterprise. A general discussion ensued of the field for application of buses and also of bus operation costs. An interesting difference in the practices of San Antonio and Houston relative to the taxing of transportation vehicles was developed by this discussion. Speaking of the situation and the views held by the city and the transportation company in San Antonio, Mr. Holden said that the principle followed there had been to charge the bus its full estimated share of paving maintenance by assessing a special license fee of $5 per seat per year, which was estimated as the cost of paving maintenance carried by street cars in that city. Additional state and federal license and tax fees bring the total per bus to approximately $600 per year. This high license cost, it was felt, would eliminate any question of unfair favoritism toward buses, and would at the same time discourage efforts of independent operators to institute irresponsible competition.

Mr. Wood contrasted the difference in viewpoint in Houston relative to this subject of co-ordinating bus and rail service. He said that here the general principle followed is that of relieving the car rider as far as possible from unwarranted indirect taxes for the benefit of property owners. Consequently there is a growing sentiment in Houston in favor of eliminating the paving burden from the car rider, rather than loading excess special taxes on bus riders to bring them into the same situation as present car riders. At the same time, he explained that a faithful fulfillment of every reasonable demand for transportation service is the only ultimate method of insuring freedom from competition.

TREADLE DOORS MAKE SAVING

Further information on the experience of Dallas with the treadle-controlled rear-exit door was brought out in the discussion of Mr. Plummer's paper. In answer to questions he explained that interlocking of the rear door with the car control had resulted in a material reduction of accidents on the line using these cars as compared with records before the installation of the automatic rear doors. He also said that a saving of $36,000 per year on one line which has been made through one-man operation was made possible primarily by the use of the rear-treadle exit door, because one-man operation of this line before the development of the door had proved to be a failure and had been abandoned.

Accident prevention became the subject of a very lively discussion at the conclusion of Mr. Dixon's paper on classification of accidents. There seemed to be some question of the practical value of a rule of the Houston

Electric Company that an operator of a street car must always have his car under such control when passing a street intersection or other vehicle that he is able to come to a full stop before a collision can occur. Mr. Plummer said that careful analysis of a large number of both class A and B accidents shows them to be caused in the great majority of cases by man failures. He advocated continuous work rather than intermittent campaigns as the best method of reducing these failures through education and training. Mr. Berry described the organization and functions of a special board of three men, which has full charge of the investigation and classification of accidents on the Fort Worth property. Mr. Holden said that best results had been obtained in San Antonio by the appointment of a special accident investigator charged with the responsibility of keeping accidents to a minimum. He favored this centralization of responsibility as more effective than any form of divisional organization.

A similar general discussion took place regarding the car of the future as outlined in Mr. Berry's paper of the type which will be specified in 1930. Improved appearance, noise reduction, better lighting and better riding qualities seemed to be the qualities considered of most importance from the standpoint of meeting public demand. It was noticeable that there was little discussion of measures for reducing maintenance or operating costs, but that thought seemed to be directed toward measures for increasing riding through furnishing greater attractiveness and comfort, rather than in the direction of economy in maintenance. Mr. Holden presented some interesting figures to show how comparatively small increases in patronage would pay for various improvements that were considered for cars in San Antonio.

At the conclusion of the business session, W. W. Holden, superintendent traction department San Antonio Public Service Company, was unanimously elected chairman of the railway section for the ensuing year. During the succeeding meeting of the general session W. E. Wood, manager Houston Electric Company and chairman of the railway section during the past year, was elected president of the entire association.

Registration figures for the meeting reached nearly 500. In addition there were many guests present who did not register. The social program was a full one for both delegates and their ladies. This included dancing, golf and cards, and also a trip on the Houston deep-water channel to the famous San Jacinto battleground.

Serving the Public Better*

By J. N. SHANNAHAN

President American Electric Railway Association

SOUTHWESTERN utility men are doing progressive, constructive work. One of your companies, the Northern Texas Traction Company of Fort Worth, in 1924 won the Charles A. Coffin award, the highest honor that can come to any electric railway in the United States. And the achievement of that organization was but one of the many in your utility field of which the state may well be proud. It is no exaggeration to say that the local utility companies of the Southwest rank as high, collectively, as those of any section of the country.

Remarks made recently at association headuarters in New York by one of your transportation leaders, Luke Bradley, indicate the reasons for the success of your transportation properties. He said:

> We believe that we are local transportation men in the fullest sense of the word. Our business is to provide rides. While the major part of our properties are composed of electric railways, we are not confining ourselves to supplying rides by them alone. Today we are going into the bus business because buses supply a helpful supplemental service. We shall continue to use them as requirements demand. If other transportation agencies are needed, we will add them to our service. "Give the best possible local transportation of all kinds, regardless of method," is and will continue to be our motto.

This is the far-seeing idea that local transportation men are adopting generally. They are in the business of moving the people, and will continue in it.

The method of handling passengers, however, is only one factor of the transportation business. Of even more importance to transportation and other utilities is the subject of good public relations. You men of this association are in the van when it comes to dealing with your riders. You are square shooters in that, as you are in other business dealings. The old-time long-horned public utility man today is as scarce as the old-time long-horned Texas steer. And the passing of the long-horned breed has been just as helpful to the utility business as it has been to the cattle business. Neither ever made much progress. The horns, while picturesque, never could be cashed in at much value. Often they were only in the way.

IMPROVED PUBLIC RELATIONS

Just as public relations have improved in the Southwest, so have they improved throughout the entire utility field. They have improved largely because the companies have told the truth to their public, and the public has come to appreciate the service and to understand the men behind it. If you doubt that the utility story is being told broadly and effectively, look around at the international meeting of the Associated Advertising Clubs of the World here in Houston next week. It is estimated, I believe, that more than $11,000.000 is being expended annually by utility companies for advertising alone, and I am proud to say that some $3,000,000 of this amount is being spent by the local transportation companies.

Advertising through the printed word, however, is only one means we are using to serve our public better. We are trying to reach our customers through each employee connected with our industry from executive down through superintendents, carmen, office help and all. We are trying to inculcate into every one from car cleaner to president that our duty and pleasure is to provide the best possible transportation as cheaply and effectively as possible.

The idea of serving the public better for the dual reason that it is more pleasant and more profitable is rapidly permeating our industry. No better proof of this can be found than in the recent selection of Lucius S. Storrs as our managing director.

One of the reasons I was glad to accept your invitation to address you was my desire to tell you about this recent move on the part of the American Electric Railway Association. Some of us have realized that one of the respects in which the association was failing to achieve all that might fairly be hoped for was in not tying the owners of the properties into the active work of the association. You all know that in the settlement of great questions of policy vitally affecting the life of the companies there is a point beyond which the operating man cannot go. A number of these questions no doubt occur to you at once. So the executive committee directed the formation of what is known as the advisory council of the association, composed chiefly of owners of the properties. This advisory council quickly realized that if its work were to be creative, if it were to function efficiently, it could only be by working through one man. This could be no man of ordinary ability, but one capable of carrying out its policies; a man of high and splendid abilities. As one after another of the members of the council set forth the qualities they deemed desirable or essential in a managing director, it seemed to some of us that such a man could not be found. But happily, he has been found in the person of Lucius Storrs.

As president of the Connecticut Company, one of the largest local transportation organizations in the world, he made an enviable record. He gave service with his heart, hand and mind, as well as by cars and buses. His riders showed their appreciation by relieving his company of unfair charges and by increasing their patronage. He never had a strike on his property. Nationally, long before he became managing director he worked arduously for every movement which came before the industry. In him we have a leader who will help us all in giving better local transportation.

Through the creation of the advisory council of owners we can, and are, tying all utility associations closer together. Their objects in general are alike, and in many respects identical. Everything is to be gained by knitting them more closely together. I am reminded of that old saw, "In union there is strength." The same elements of society that are found fighting one of these utilities at one time are found arrayed against another at a different time. They fight us piecemeal and not infrequently beat us. We need to band together for defense, for study of our common problems and also for united action.

---

*Abstract of address made before Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

In one respect, I am sorry to say, Texas is falling behind her sister states. That is in not recognizing in her statutes what is otherwise so obvious—that the bus is a common carrier. More than three-quarters of the states have recognized that fact in recent enactments and have placed buses under the control of the various state commissions. Curiously enough, as soon as a wildcat jitney grows up to be a bus and is operated on a regular route, then its owner ardently desires regulation, and the protection that regulation gives him from other wildcat and irresponsible operators. In that connection, I cannot close without drawing your attention to a national situation, one in which you all can help. I refer to the status of interstate bus operations. Two months ago the Supreme Court of the United States handed down a decision in which it said that the states are without power to regulate such traffic. Two cases brought forth this dictum, one originating in the State of Washington and the other in Maryland. We are told, on the other hand, that the Interstate Commerce Commission is without power in the premises, nor is there any other federal body in which such power resides. And so the carriers, steam, as well as electric, find themselves being taxed to build and maintain highways over which this interstate bus traffic is eating out the very vitals of the carriers themselves.

There is now being drafted, under Mr. Storrs' direction, a bill to remedy this impossible situation; a measure fair alike to the public, to the bus operators and to the older carriers. In drawing the bill he has sought and obtained the co-operation of the National Automobile Chamber of Commerce, the American Railway Association, the Short Lines Association, the National Electric Light Association and the National Association of Railroad and Utilities Commissioners. Now, here is where you all can help. When this bill is ready for presentation, a copy will be sent to each one of you. It is our hope and desire that you make it your business to see your own Congressman (and any others you know) and convince him, before he returns for the next session of Congress, of the fairness of this bill, and the desirability, aye, the necessity, of promptly enacting it into law. Gentlemen, we ask your good offices in this matter. You can do vastly more with Congressmen at home than you can in Washington.

Current-Collecting Devices*

By L. E. Delf† and G. F. Tongue‡

†Electrical Engineer Northern Texas Traction Company, Fort Worth
‡Assistant Engineer Dallas Railway, Dallas, Tex.

Very little data have been obtained on the relative costs between the use of trolley wheels and sliding contact. The information available indicates, however, that the cost of shoes is considerably greater than the cost of wheel operation. It is quite possible that some of the costs for wheel operation do not represent actual conditions inasmuch as the 1924 report of the American Electric Railway Engineering Association committee on equipment indicates that wheel costs per thousand car-miles range all the way from 2 cents to 33 cents. Very few properties maintain an accounting system whereby they can accurately segregate cost of current-collecting devices. Opinion seems to be quite evenly divided as to the effect of the sliding contact on the cost of maintaining the overhead wire system and the trolley poles and bases, although experience seems to indicate that the wear on unlubricated trolley wire is greater when the sliding contact is used.

At the midyear meeting of the Maintenance of Way Section of the Southwestern Public Service Association held in Fort Worth on Feb. 4, 1925, the authors were appointed a committee to secure information on various devices for trolley current collecting with special consideration to a comparison between trolley wheels and sliding contact devices.

In view of the very little information available on the subject of comparative results between the use of trolley wheels and sliding contact devices, the Northern Texas Traction Company of Fort Worth has compiled some data covering a period of six years. During 1922 this property discarded the use of wheels entirely on both the interurban and city divisions and adopted the Miller trolley shoe.

As the following tabulations will indicate, 1922 covered a period during which the change from wheels to shoes was made, and both wheels and slides were operated during this year. This property has approximately 173 miles of trolley wire and operates a total of approximately 8,600,000 car-miles per year. The following tabulations have been arranged so that wheel and slide operation are readily comparable.

COMPARISON OF TROLLEY WHEELS AND SLIDES IN FORT WORTH, 1919-1924

	1919	1920	1921	1922	1923	1924
1. Mileage of Trolley Wheels and Slides:						
City Division						
Trolley wheels	4,656	7,085	6,445	4,343	....	....
Trolley slides	....	....	....	7,844	6,661	6,308
Interurban Division						
Trolley wheels	5,195	2,778	1,754	....	....	....
Trolley slides	....	....	1,247	1,651	2,311	2,972
2. Cost of Trolley Wheels and Slides per 1,000 Car-Miles:						
City Division						
Trolley wheels	$0.324	$0.236	$0.449	$0.306	....	....
Trolley slides	....	....	....	0.228	$0.237	$0.239
Interurban Division						
Trolley wheels	$0.312	$0.615	$0.896	....	....	....
Trolley slides	....	....	1.639	$1.070	$0.709	$0.507
3. Cost of Trolley Wheels and Slides as Whole Including Harp and Fittings) per 1,000 Car-Miles.						
Both Divisions						
Trolley wheels	$0.848	$0.960	$0.144	$0.861	....	....
Trolley slides	....	....	4.00	1.160	$0.928	$0.868
4. Total Cost of Car Equipment Material (Trolley Pole, Harp, Wheel or Slide, Rope and Fittings) and Cost of Line Material (Trolley Wire, Ears and Splicers):						
Car-miles	8,029,243	9,044,829	8,782,208	8,422,863	8,485,715	8,671,596
Car equipment	$6,723	$6,735	$6,545	$5,409	$4,107	$3,530
Line material	16,653	22,440	17,283	8,566	6,159	6,153
5. Trolley Breaks and Wire Strung.						
City and Interurban Divisions						
City breaks	No Data	No Data	313	178	73	47
Int. breaks			45	13	5	2
Wire strung, ft.	117,584	133,622	127,332	67,394	63,870	40,217

6. Cost of Trolley Wheel and Slide:

Wheel only	$1.39	Slide only	$1.50
Harp only	1.69	Harp only	1.77
Fittings	.92	Fittings	1.28
Total	$4.00	Total	$4.55

The above figures indicate that the mileage obtained from the slide contact on the city division is approximately the same as that obtained from wheels. The same holds substantially true for operation on interurban trains. The city division has effected an appreciable saving in the cost of trolley wheels and slides during the period of slide operation. The cost on the interurban division has remained substantially the same.

A method of building up wornout slides has now been perfected, so that the cost figures shown above should be greatly reduced during the coming year. A new slide costs $1.50. By building up old slides with electric arc welding and grinding the contact surface the cost of replacement slides is now running 16 cents per slide. Item No. 4 shows up quite clearly the total saving that has been made on this property by the adoption of slide contacts and item No. 5 shows the tremendous reduction in trolley breaks brought about in the past four years.

It has been found that the trolley shoe clings to the wire very much better than does the wheel, even when passing through the large amount of special work that is found on the city division. The drumming noise on the roof of the car has been practically eliminated by the use of the slide. This property does not use sleet cutters, and during a recent severe sleet storm, which tied up a number of lines in this territory, service was maintained without interruption except for one burn down which tied up service for about an hour.

---

*Abstract of report presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Comparing the operation of the years 1919 and 1920, during which wheels were used exclusively, and 1923 and 1924, during which slides were used entirely, the cost of trolley poles was reduced from an average of $771 per year to $282 per year, or a decrease of 64 per cent. The cost of trolley rope was decreased from an average of $1,566 per year to $611 per year, or a decrease of 61 per cent. The quantity of trolley wire used for maintenance purposes was decreased from 125,603 feet per year to 52,044 feet per year, or 59 per cent. The above figures include both city and interurban divisions.

It was found that the slide could not be operated satisfactorily on the grade of trolley wire on this property without lubrication of wire, and consequently a system of periodic greasing once every month was inaugurated. The cost of this greasing has averaged $2.12 per mile per year, which is a very nominal amount compared to the savings effected.

Trouble reports, due to frogs throwing trolleys and dewirements in general, have decreased materially, and both city and interurban trainmen are very enthusiastic boosters for the trolley slide.

The Street Car of 1930*

By V. W. Berry

General Superintendent Northern Texas Traction Company, Fort Worth, Tex.

"1930 MODEL CARS" will vary in size according to service requirements. In the smaller cities and on light traffic lines in the larger cities weights and seating capacities which will permit frequent headways and low operating costs will be universally used. In medium size cities and for the greater part of the service in the larger cities cars of greater weight and capacity will be extensively used. On some of the heaviest traffic lines in the larger cities multiple-unit trains of two or more cars each will be used. The use of the various sizes will depend upon service requirements in the different cities and localities, and there will be no specific standard size of street car in 1930.

Appearance and attractiveness are recognized to be of great importance in merchandising. In general, the exterior appearance of the 1930 model street car will not differ materially from the present type, except that square corners will be rounded off and the appearance will be further improved by painting with brighter and more attractive colors. The result of effort along these lines will be to produce a car more attractive and pleasing to the eye. The interiors of present cars offer an opportunity for decided improvement. The rough floor, exposed valves, control, apparatus and pipes, inefficient and unattractive methods of illumination and the many unsightly corners and angles contribute to a condition not at all attractive.

Improved riding qualities will be a feature of the 1930 model street car. One has but to take a ride on a 1900 model longitudinal-seat car, operated at a speed to meet present schedule requirements, to realize that much progress has already been made. Further development in this direction is even now actively under way.

Until recent years, little attention was paid to the noise made by street cars, but the comparison furnished by the automobile is directing attention to this factor in increasing degree. There are many things that contribute to the noise of car operation. Some of these sounds are of minor importance at their source, but are amplified by the sounding board effect of the car body and other parts of the equipment until they become very objectionable. Operating on a surface of smooth steel rails, it appears quite possible to reduce materially, if not entirely eliminate, all of the objectionable noises of the street car. Scientific study of the causes will result in elimination of the noise at its source, or will so damp it that it will not be objectionable.

Cost of operation will not be materially reduced by the use of the 1930 model street car. The added expense of providing the many improvements to the car, so necessary from the standpoint of merchandising, will effect economies resulting from the further use of light-weight cars. This will be accomplished by the use of better materials in construction. Thus reduced weight and scientific application of proper sized units to a particular service will just about offset the added expense occasioned by improvements in the cars. These improvements will make the street car continue to render a local transportation service superior to that of any other public vehicle.

---

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Labor-Saving Equipment in Trackwork*

By E. S. Meyers

Superintendent of Roadway New Orleans Public Service, Inc., New Orleans, La.

WE HAVE been and are using continuously in New Orleans four side dump trains and one center dump train, each train consisting of a motor car and trailer; the capacity of each car is 20 cu.yd. or 40 cu.yd. per train. The trains are used on both construction and maintenance jobs for hauling sand, gravel, slag, ties and excavated material.

The center dumps are more economical than the side dumps when operations are confined to single track, as they discharge and scatter material directly in the track, whereas with side dumps, the material would have to be shoveled into the track at additional cost. On double track ballast is deposited in the track by either the center dump operating over the track requiring material, or by the side dumps discharging from the opposite track directly into the track requiring the material. The side dumps are used to advantage in hauling sand and gravel and distributing it on jobs when street paving is in progress and where tracks are to be built of concrete construction. Besides a saving in the actual material and hauling charge, there is a resultant economy in concreting due to the fact that there is less hauling distance to the mixer.

During 1924 our company built 8.5 miles of concrete track construction and reconstructed 26.6 miles of track, using slag as ballast.

We recently performed some work that permitted a good comparison between the cost of placing material in the track with a flat car and a Differential train. The figures are based on a 5½-mile haul and an average day's work, the same crew required for either the flat or the Differential. The crew worked ten hours at a total cost of $11.10.

The flat car train consisted of one small motor car and a 15-cu.yd. flat car. Unloading took nine men twenty minutes, or a total of three man-hours. at 30 cents per hour. This was 90 cents for unloading labor. The total material hauled in a day was three loads or 45 cu.yd. This made the cost of unloading 6 cents per yard. To this was added the cost of the train crew ($11.10 ÷ 45) or 25 cents per yard, making a total of 31 cents per cubic yard handled.

The Differential motor and trailer had a capacity of 20 cu.yd. each and also made three trips a day, hauling 120 cu.yd. The material was unloaded directly into the trench, the only labor being that of the train crew, $11.10. Thus the cost per cubic yard was $11.10 divided by 120, or 9 cents per cubic yard. This indicates a direct saving of 22 cents per cubic yard handled.

Summing up the quantities handled in 1924, exclusive of excavated material, the total saving would be: 46,799 cu.yd. at 22 cents, $10,295.78. In addition a saving of $9,000 was made in the cost of handling excavated material which is sold for filling purposes and which costs about 15 cents per cubic yard to unload from flat cars.

For excavating construction jobs, we use a 5½-cu.yd. Marion electric shovel, mounted on a caterpillar tractor. When the machine is not in use for excavating, we replace the shovel with a clamshell bucket and use it for handling special work, slag and unloading heavy material. The weight of this machine is approximately 60,000 lb., and we transport it from place to place on a large Freuhauf trailer.

On a recent excavation job due to a change in street grade, which involved moving approximately 16,000 cu.yd. of material, the labor cost of operating the machine was as follows:

One operator, ten hours at 80 cents....	$ 8
Four laborers moving mats, ten hours at 30 cents	12
Total cost per day....................	$20

The largest run made was in a stretch 485 ft. long by 10 ft. wide by 3.5 ft. deep, in which 646 cu.yd. of material was removed at a cost of 2.9 cents per cubic yard. The average cost of digging the material and placing it alongside the track was 4 cents per cubic yard. The cost of removing about 200 ft. of the same trench by hand cost us 60 cents per cubic yard, so that the saving made by the machine on this one job was $8,960.

---

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

We also have a Haiss loader, which, although designed primarily to handle loose material, has proved very satisfactory for digging out trenches where the material is dry and mixed with shell such as we find in our old roadbeds. We also use this machine to good advantage, removing dirt excavated by hand and piled alongside the trench, loading directly on to our Differential cars at a cost of 8 cents per cubic yard.

A Barber-Greene conveyor mounted on rubber-tired wheels is used in connection with the Haiss. The city is always desirous of getting the filling from our tracks to top unimproved streets. Frequently arrangements are made whereby they drive alongside our conveyor and the material is discharged directly into their carts, thereby saving us the cost of extra handling.

As the bearing power of the soil in New Orleans is very weak, we find it necessary to place concrete slabs under the tracks at all paved intersections. For this purpose we purchased a 7-L Jaeger tilting drum concrete mixer with loader, operated by electric motor and mounted it on an electric truck. The capacity of the mixer is 7 cu.ft. of mixed concrete. The machine is operated directly alongside the trench depositing its material right in place, thus saving a hauling charge. The working capacity of the machine is approximately 125 cu.yd. per day, based on a 1:2:4, one-minute mix.

The following is the cost of labor per cubic yard of concrete in place on a job 112 ft. long:

Material haul to mixture	100 ft.
Mix 1:2:4	1 minute
Time required to mix 25 cu.yd.	2 hours
Labor 20 men, two hours at 30 cents	$12
Concrete	25 cu.yd.
Labor cost mixing and placing concrete $12 ÷ 25 cubic yards =	$0.48

We have three oxyacetylene motorcycle outfits for general cutting. The tanks are mounted on a specially designed side car, which in turn is welded to the motorcycle, comprising a compact outfit. These machines are equipped with 100 ft. of hose, each torch having a complete set of cutting and burning tips so that it can cut rails, bolts, and burn holes as desired.

When reconstructing track we cut the old rail up in 10-ft. lengths. The tie rods are also cut and sold to the junk dealer. The cutters are invaluable when large special work changes are required.

We have recently conducted some tests to show the effect on the steel due to burning holes with the torch. We find that the metal is affected for a distance of only ⅛ in. from the hole, and that only a thin crystallization film is observed at the hole surface. Our conclusion is that burning does not impair the strength of the metal.

WELDING, GRINDING AND BONDING OUTFITS

In the early part of 1921, out of a total of 210 miles of track, 55 miles was in paved streets, 64 miles in unpaved streets and 191 miles in neutral or reserved strip. The track in the neutral ground was generally of tee rail construction and in paved and unpaved streets of various 9-in. trilby and tram rail sections, all joints being of bolted construction. A large percentage of this track was in a deplorable condition, due to loose bolts and worn joint places which required everlasting attention.

Our company decided on a broad program of seam welding these joints. To carry on this work and for subsequent welding operations, we have the following equipment:

8 Type WW RWB dynamotors.
1 Type B RWB dynamotor.
1 G. E. motor-generator set.
1 Wilson O-B bonding dynamotor.
3 Oxyacetylene cutting outfits.
2 Universal rotary grinders.
1 Reciprocating grinder.
1 Small portable electric hand grinder.
1 Large self-propelled Goldschmidt grinder.

Four of the Type WW RWB dynamotors are each mounted on a Graham-Dodge truck, one on an electric and three of them on 1-ton Ford trucks. Each truck has a specially designed body to carry the welding machine, and all the supplies and equipment. The O-B Wilson bonding machine is mounted on an all welded side-car attached to a motorcycle. This outfit is also used as an emergency welding outfit. The G. E. motor-generator set, the type B RWB dynamotor, the three cutting outfits, the small portable electric hand grinder and the Goldschmidt grinder are part of the welding shop outfit.

Our portable welding machines are used on all new construction jobs where seam-welded joints are used, also for the purpose of reclaiming crossings, frogs, switches and mates by making them flange-bearing with manganese. In the last 2½ years we have welded more than 50 manganese switch points, and to date have not had a single failure.

We have reclaimed crossings that would have been replaced, before we installed this equipment. In the repair of hard center manganese work, we have been called on to repair crossings having the old style hard center with stirrup plates that are held in place by keys. Where the stirrups have broken off we use the oxyacetylene torch to cut out the broken part. The blacksmith makes new ones which we weld in with manganese electrode. By the manganese process we make the crossings flange-bearing and practically noiseless.

On mates of the manganese insert type, where it is difficult to remove the insert, and where part of this insert has failed, we have reclaimed the mates by cutting the broken part out with the oxyacetylene torch, and then welding in a low carbon base to the form of the original piece. This is covered with one layer of manganese steel, after which it is ground with the rotary grinders.

Besides welding trackwork, we weld in our shop all kinds of castings, steel, cast iron and non-ferrous metals, including truck frames, bolsters, axles built up, armature shafts, etc.

For use with pneumatic tie tampers as well as for breaking concrete, we have two portable units. One unit is an Ingersoll-Rand belt-driven compressor and the other a direct-connected Westinghouse compressor. Both machines are 110 cu.ft. capacity, operating either four tampers or two concrete breakers each. The machines are mounted on electric trucks which were rebuilt at small expense for this purpose. The use of portable machines is advantageous as we can run around the city from one job to another without loss of much time. The operator of the truck has charge of the tamping gang of four men. All tamping is under his supervision.

We have recently purchased and are using a Jackson electric tie tamper for maintenance work. This tamper is giving satisfactory results so far and is operating with the same labor and at approximately the same cost as the pneumatic tampers. However, we do not get as good a job with the Jackson as we do with the pneumatics. With the exception of rough surfacing of the track, these machines have eliminated all hand tamping.

Treadle Car Operation*

By GEORGE I. PLUMMER

Superintendent of Traffic Dallas Railway, Dallas, Tex.

IN DISCUSSING the rear door treadle car I must necessarily refer to our experience in Dallas, since Dallas was the pioneer in the construction and operation of this type of car.

The construction of the new type automatic rear-exit equipment was the result of careful study and application of our experience to the operation of one-man cars. Service conditions were critically analyzed to devise means whereby the car could be loaded and unloaded quickly in all kinds of traffic. We sought to avoid the difficulty of slowing down traffic by waiting for slow moving negro passengers to leave the car. Our method of traffic control by means of synchronized semaphores made it necessary to have quick stop and get-away features. In heavy traffic the services of outside fare collectors and loaders was necessary. In the light of all these requirements our traffic department, in co-operation with engineers of the National Pneumatic Company, finally developed a type of mechanism and method of operation that seem to be highly satisfactory.

The car immediately met with favor on the line, where previously a single-door one-man car had been operated, but was removed on account of public disfavor. This line serves the most exclusive residence districts in the city of Dallas. All of these high-class homes have numerous negro servants and the race problem was, therefore, present. We found that the negroes were very quick to adapt themselves to the change, thus completely solving that particular problem.

During the rush hours this rear treadle door is operated from the outside by street collectors for loading.

---

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

This permits a maximum load to board the car quickly. The result has been that the earning capacity of this car has been about the same as the two-man cars previously operated on the line, with the same schedule and headway, except slightly increased headway during the rush hours made necessary on account of increased riding brought about on account of popularity of the car.

When it became necessary to substitute two-man cars, with longitudinal seats, a protest was immediately lodged with the city officials—the people claiming that they were entitled to the newer type of car on that line all the time. These were the same people that previously had objected to, and caused the removal of the small one-man cars from their line.

While the first twenty cars were built on permit of the city officials, who were very careful to prevent any publicity prior to the completion of the cars, the result of their operation has been such that they have unhesitatingly granted permission for as many additional cars as the company desires to equip. The cars have met with universal satisfaction, have eliminated complaint on account of negro problems, uncomfortable jerking of car and aisle congestion, with the economies possible in one-man operation. In our candid opinion they have solved the problem of one-man car operation on properties in the larger cities on heavily traveled lines, particularly in the South. We feel that this car can be used on any city lines, regardless of the amount of traffic, with approximately the same number of cars as would be necessary with two-man operation and at approximately the same schedule speed.

Management and Operation Advisory Board

REVIEW of the work accomplished to date was the principal matter under discussion at a meeting of the advisory board of the management and operation committee of the American Association, held May 9 at association headquarters, New York. Up to date 69 field reports and 221 detail reports have been received. District 2 is in the lead in the number submitted. In order to get all of the material in sufficiently early to formulate the annual report of the committee, it was proposed to send out a letter to all members of the committee requesting their co-operation.

For the annual report of the committee, it was proposed to have seven district reports combining the city and interurban work and to have an eighth report from Canada. It was considered advisable to publish articles in *Aera* and technical magazines previous to the convention if the matter justifies it.

It was decided that such material as is received and is considered worth while be published in a handbook. The recommendation of the advisory board is that the handbook be published in permanent form, uniform in size and style with the Association Proceedings and the Engineering Manual.

Regarding the use of a booth at the Atlantic City convention next fall to hold exhibits of operating companies, it was considered inadvisable to request companies to exhibit material illustrating poor maintenance methods.

A letter received from W. H. Boyce was read. This was to the effect that the attention of the industry should be brought to the desirability or necessity of good housekeeping, particularly about shops, carhouses and yards. The letter was commended by the advisory board.

Members present were: R. F. Carbutt, New York, vice-chairman; R. B. Stearns, Boston; R. W. Emerson, Cleveland; W. H. Boyce, Pittsburgh, and Samuel Riddle, Louisville.

American Association News

Heavy Traction

SUBJECTS proposed for inclusion in the annual report were discussed at a meeting of the heavy traction committee of the Engineering Association, held at association headquarters, New York, on May 8. Those present were: J. C. Davidson, chairman; A. H. Armstrong, H. F. Brown, Morris Buck, A. H. Candee, representing H. W. Cope; A. H. Daus, J. T. Hamilton, Norman Litchfield, Mr. Wilkins, representing L. S. Wells, and G. C. Hecker, special engineer.

Protective coatings for iron and steel were the subject of considerable discussion. Mr. Hecker reported that a sectional committee of the American Engineering Standards Committee has been formed to take up the subject of standardizing zinc coatings. It was felt by the heavy traction committee that the subject of protection against corrosion of metals used in electric railway service be given consideration, in addition to the subject of zinc coatings. It was proposed that the committee on subjects of the Engineering Association assign this topic to a special committee next year.

Mr. Brown stated that the bibliography of heavy electric traction has been completed and turned over to the secretary of the association. A motion was passed to determine the cost of keeping the bibliography up to date each year. The secretary was requested to obtain from the Association printer an estimate of cost of publication in bound form in an addition of 500 or of 1,000 copies. It was proposed that he take up with other associations interested the publication of the bibliography. In this way it was felt that the cost could be shared by a larger number of persons so that it would not be burdensome.

Mr. Armstrong presented a tentative report for the sub-committee on branch line electrification and self-propelled cars. This report was accepted, subject to comments of the committee members.

A preliminary report on the subject of articulated trains was presented by Mr. Daus. This was received as a report of progress.

Bibliography on Heavy Traction Now Ready

CONTAINING a selected list of references on all subjects connected with heavy electric traction and railroad electrification, a new bibliography has just been prepared by the heavy traction committee of the Engineering Association. References are included from nineteen English-speaking papers and ten foreign-language papers. All of the entries are made by years and are cross-indexed so that reference can be made in a number of ways. Each periodical is given a reference number, so that it is easy to locate all articles that have appeared in one publication. There is a cross-index by authors, another by companies and localities, and a third by subjects. Thus the engineer who is interested in research from any particular angle will have no difficulty in locating practically every article published on the subject.

At present, the bibliography is in manuscript form and is on file at the office of the secretary, 292 Madison Avenue, New York City. It is available for inspection by any one interested Plans are now being made for publication in permanent form.

Revision of the bibliography will be made each year. The arrangement is such that articles appearing in successive years will be grouped together, so that such additions will be easy to make. Plans are now being prepared for carrying out this annual extension of the bibliography, so that it will always be up to date.

Buildings and Structures

SEVERAL subjects for inclusion in the annual report were reviewed at a meeting of the committee on buildings and structures held at association headquarters, May 7. Those present were W. F. Graves, chairman; F. H. Miller, sponsor; J. D. Kent and H. R. Stamm.

In considering existing standards, the committee decided that the miscellaneous methods and practices regarding design of small bridges, culverts and trestles should be changed to conform with recommendations of the bureau of simplified practice of the United States Department of Commerce. The subject of design of buildings for storage and maintenance of buses and that of bus terminal design have been combined and will be reported on together. A large number of plans and photographs of recent constructions were gone over and decisions were made as to which of these should be incorporated in the report.

The subject of terminals for buses has been divided into those for city and those for interurban operation. City terminals have been further subdivided into buildings leased and rearranged for a small number of buses without storage; terminals with facilities for simple repairs; terminals with garages combined, and bus terminals without garages. Interurban terminals were subdivided into bus terminals proper and combined electric railway and bus terminals.

Desirable features of terminal design were decided upon, such as location, width and distance between loading platforms, housing area, height from top of finished floor to lower chord of truss, material, equipment, heating, lighting, ventilation, fire protection, oil and gasoline storage.

In reporting on the various designs, statements will be incorporated to show outstanding features. A compilation has also been arranged of the salient features of a large number of bus garages. This will be included in the report.

Carhouse and car shop standards were considered. The question of modification of the specification for carhouse wiring was left open, awaiting a decision from the special committee which is studying this subject.

Manufacturers' Night at the Metropolitan Section

SERIOUS business and burlesque were intermixed at the meeting of the Metropolitan Section of the American Electric Railway Association held May 8 at the Engineering Societies Building, New York. The topic of the evening was "Boost the Railways." The meeting was in charge of manufacturer members. Carl Beck of the Westinghouse Companies acted as chairman and Jerry Stanton of the Ohio Brass Company acted as secretary.

The session opened with the principal business of the evening, an address by Lucius S. Storrs, managing director of the association. Mr. Storrs' address is abstracted elsewhere in this issue. Following the address, humorous reports were read by the acting secretary and other manufacturer members representing the various officers and committee members. Harry Vanderveer, National Pneumatic Company, delivered a paper which consisted principally of its title, and L. T. Carter, General Electric Company, gave an extemporaneous speech without a subject.

Following this phase of the program, an entertainment was given by Joseph Dunninger, who mystified the audience with several clever mind-reading demonstrations. Other entertainment was furnished by the Peddlers' Troubadors. Following the meeting a buffet lunch was served.

The Electric Railway—An Indispensable Service*

The New Managing Director of the Association Points Out That the Electric Railway Is Responsible for the American City of Today, and That the Continuance of Urban Prosperity Depends on It

By Lucius S. Storrs

Managing Director American Electric Railway Association

WE ALL represent one of the greatest if not the greatest industry in America. With but a single exception all of the 288 cities of the United States having a population of 25,000 or more are served by an electric railway. Some of them are a little frayed around the edges, but they are serving the people, however. There are 44,000 miles of electric railway tracks. Some people said a part of that was going to be ripped up, but it was a very small part. There are 100,000 electric cars operating over those tracks and 300,000 people are employed in this most useful service, receiving a gross annual payroll of $450,000,000.

The value of this electric railway plant constitutes 2 per cent of the national wealth, or $5,624,000,000.

Last year the electric railways carried a total of 16,000,000,000 passengers, or 140 rides for each inhabitant of the United States. Our steam railroads are vital to our country, but they carry per annum less than one-tenth as many passengers as are carried by the electric railways, and last year all of the steam railroads in America carried 100,000,000 passengers less than were carried on the surface lines of the City of New York.

The growth of the American cities has been made possible largely, if not solely, by the expansion of the electric railroads. Due to the enthusiasm of the executives in the early days of the electric railroad, the electric rail lines have not been confined, as they are quite generally in European cities, to the built-up sections of the cities. We would then have had, in this country as abroad, a reproduction of the congestion of the population within limited areas instead of the growth of residential districts throughout large areas.

In 1890, when the electric railway industry was just beginning, the population of the United States was about 63,000,000. Today our population is nearly double that. The last national census showed that half of the total population is in the cities and towns of 8,000 inhabitants or more. As late as 1900 only one-third of the total population was urban. The next census will show the rural population to be considerably less than half, I am sure, for the trend toward the city has not stopped.

The cause of the growth of the cities and large towns lies in the tremendous industrial development of the nation. Wherever there is a good manufacturing site, with good transportation facilities, there has been built up a thriving city or town. No city can grow and expand if there is not good transportation service. This service has been supplied by the electric street railway.

What are the outstanding inducements the people of a community make, even today, to a prospective industry? Are they not something like this: "We have a fine street car system, a fine location for your plant, good freight facilities, good power supply, nearness to your source of raw materials and accessibility to your markets, contented inhabitants and a good supply of the kind of labor you need."

Car Lines Have Made Prosperity

The electric railways have not only made it possible for manufacturers to do business profitably, but they have opened up vast tracts for residential purposes, they have increased the value of the entire community, created markets for the merchants, the farmers, the lumber dealers, the department stores, for everybody. Sometimes the business these trolley lines did returned them a profit, but in many cases the investment that made profits for others was a losing one to the railway investors.

Of the 43,000 miles of electric railways in the United States, 26,000 are in the cities and towns of 8,000 and more, and 17,000 are through rural districts. They are not decrepit lines. They are not "busted." They are serving the cities and towns day in and day out for nominal returns.

We all know that there are many lines that are not paying ventures, but the reason is not that the services the lines render are not necessary ones. The reason is that the electric railways have been fair prey for every demagogue who cared to attack them, preventing them from getting fair and just consideration from the public. The franchises under which they operate, subject to complete public control as to rates of fare and quality of service, have been declared by the demagogue to be "million dollar grabs," whereas, in fact, they have been nothing more than permits to render the public a vitally necessary service for a mere pittance.

The public has been deluded by this kind of talk, and only during the last year or two has it begun to awaken to the fact that such attacks are more damaging to the community than they are to the railways, although we know very well that they have been tremendously damaging to us. The demagogue talks about "protecting the people" against "the interests," and the pity of it is that "the people" for a time take the demagogue seriously. The demagogue shouts for public ownership, the "5-cent fare" and the destruction of the investment that has made possible the creation of the great cities of this country, whereas, in fact, all that he seeks is the perpetuation of himself and his followers in public office.

If he could put his program through, he would make every job on the system a political one. Efficiency would count for nothing—the losses would be absorbed by the taxpayers. But there are signs that the people are getting on to the demagogue. A game of that kind can be played only so long. The public demands service, and when the demagogue doesn't give it, when he gives only denunciation and vituperation, the people size him up for what he is, and sooner or later rid themselves of him.

---

*Abstract of an address before the Metropolitan Section, A.E.R.A., New York, May 8, 1925.

In a city like New York, where politics continually beclouds economics, the services which the electric railways have rendered, are rendering and must render in the future are not always recognized nor appreciated. Yet, were it not for the rapid transit system which has been developed here, New York could not be the great metropolis that it is. The electric railways have built up this city just as they have built up all the great cities, and for that matter the small cities in America. I challenge any one to name one prosperous, thriving, progressive community that did not win its prosperity and wealth and assure its future through the services of its local electric railway company.

It is not so many years since the first skyscraper was built in lower Manhattan. Today there are hundreds of them to which every morning, and from which every afternoon, there are carried millions of human beings. As you know, they come from the Bronx, from Westchester, from Queens, from New Jersey, in electric trains and electric surface cars. Were anything to stop the services which the electric railways render, this great city would quickly be deserted. This community depends absolutely on its transportation facilities.

There is no need for me to emphasize these facts to such an audience as this, but it is well perhaps to declare again the absolute essentiality of the business in which we are engaged. We are rendering an indispensable service. The electric railway systems of this country are the very arteries of our urban life. I have no fear for their future, because I know that nothing can take their place. There are tremendous problems to be worked out to make them more efficient and to win for them the public recognition and sympathy to which they are entitled, but regardless of these problems, the fact always remains that these lines, whether they be in New York City or in some town of 25,000, are absolutely essential to the prosperity and security of the country and the comfort and convenience of the individual.

The latest United States census of electric railways shows that in 1922 each inhabitant rode 116 times—at least that was the average. Some doubtless walked, and we know something about automobiles. In 1890 there were but 32 revenue rides per inhabitant. The number of revenue rides is much greater in the cities. In 1922 there were 257 per capita, an increase from 109 in 1890. In the City of New York last year the electric railways carried a grand total of 2,672,940,319 passengers. That was on increase of 100,000,000 over the number carried in 1923. The per capita rides in the City of New York have increased from 218 in 1890 to 448 in 1924. While the heaviest increase has been on the rapid transit lines, the surface lines also have carried increased numbers of passengers. The surface lines alone carried 1,061,402,247 passengers last year. These figures do not include the passengers carried by the Williamsburg Bridge line. There has not been a year since 1860, when records of the Transit Commission begin, until the present, that has not shown an increase in the number of total passengers carried.

The figures themselves are sufficient refutation of the statement that the surface railways are obsolete and must be supplanted by some other form of transportation. That kind of talk is plain buncombe. A few months ago the merchants of 42d Street and of 125th Street uttered vigorous protests against any scheme that would deprive them of surface car service. These people are awakening to the danger of impairment of their service, and sooner or later they will arise and compel a fair deal for the street car.

REAL ESTATE A PRINCIPAL BENEFICIARY

The owners of real estate have been the particular beneficiaries of electric railway service. All of us know of scores of instances of value being created by the building of an electric railway. The real estate man advertises, "Twenty minutes to city hall by subway," "Street car service to all parts of the city," and so on. Swamps and barren sandlots become colonies of apartment houses and comfortable dwellings when the rapid transit lines and the street cars come. You have seen it right here in New York, and all of us have seen it throughout the country.

Thirty years ago, when electric railway service was just beginning, the population of New York was under 3,000,000. There were no skyscrapers. At that time the valuation of taxable real estate in New York was approximately $2,500,000,000. As time went on, the genius of Sprague, Westinghouse, Thomson, Edison, Coffin, Hedley, and all the others who have contributed to the greatness of this industry, was at work, and today you have a city of more than 6,000,000 of inhabitants with taxable real estate valued at nearly $11,000,000,000, a sum of money the human mind cannot comprehend. I will say in all seriousness that New York's greatness was created by its transportation companies. Its future greatness depends just as much on the provision of additional electric railway service.

So well understood is this fact in other parts of the country that the states and communities have taken steps to assure the people of continuity of electric railway service. In Boston, for example, and throughout eastern Massachusetts, the people, through their legislative bodies, have provided for the payment of operating deficits, should they occur, through taxation of the communities served. Small towns are empowered to make appropriations to be paid to the electric railway companies to assure the continuance of street car service. In some places, usually very small towns where the electric railway could not operate profitably and the security holders had to give up, the towns themselves have assumed the operation of the lines at public expense.

The point of these remarks is merely this: The street car, whether it be a rapid transit subway train or a one-man trolley, has proved itself to be as necessary to the people as their water supply or their fire department.

Consider how steadily the use of the electric railways has increased. In 1902 they carried some 4,775,000,000 passengers; in 1907 they carried 7,440,000,000; in 1912 the traffic had grown to 9,545,000,000; in 1917 to 11,300,000,000; in 1922 to 12,680,000,000, and in 1924 to 16,000,000,000.

These figures may be a little dull, but they are tremendously significant of the place the electric railways have in the civilization of the United States.

I have no fears for the future of this industry. I am most optimistic about it. I know that you have no fears about it. What we are all most concerned about is the problem of getting the public to understand this business as well as we understand it, and to treat our problems as economic ones and not as political ones.

PUBLIC IS BEGINNING TO APPRECIATE THE PROBLEM

Progress is being made along these lines. I believe that the public is beginning to understand that the wholesale attacks which are made upon the electric railway companies are unjust and based on falsehood. I have faith in the intelligence of the American people, once the people are informed of the facts. The big job before all of us is to bring about this public understanding of our business. Any electric railway man in fifteen minutes can demonstrate to any reasonable-minded person that were it not for the service his company renders and has been rendering, his community could not enjoy its present wealth and prosperity. It will not do for us to sit back and complain about the injustice of those who are attacking us. We have got to get out and state the facts. We cannot bring about complete public understanding in a few days, nor perhaps in a few months, but by steadily keeping at the job we shall in time reach the goal. In the past we have been too prone to writhe in silence under attack. Today our attitude should be different. We all know that we have something to sell, which we offer at a low price, and which the public needs and must have. We must insist on a fair deal.

I have been an electric railway man for 20 years. I am still an electric railway man, and I expect to continue to be an electric railway man. Most of you men have been in this business as long and perhaps longer than I have. You will all agree with me that it is the greatest business in the world, a business in which men fight shoulder to shoulder against tremendous odds, a business in which the fighting spirit is developed to its highest pitch, a fighting spirit that is directed to the service of the people, that makes men go without sleep and without food in order that the cars may run, a spirit that makes men undertake dangerous tasks with small personal profit, a spirit that is indomitable.

This spirit is born in us. Here's to the electric railway industry and to the 300,000 men who are running electric railways throughout this broad land, men who never say die, who never quit under fire, and whose lives are devoted to the service of their fellowmen.

The News of the Industry

No Strike in Cleveland

Men Voted on May 9 Not to Seek to Contest Open Shop Plan—Wages Advanced 5 Cents

Cleveland's street railway system has been put upon the "open shop" basis without a strike of its platform employees. Upon the refusal of John J. Stanley, president of the Cleveland Railway, to agree to a wage increase of 10 cents an hour and to sign a contract with Division No. 268 of the Amalgamated Association, the Cleveland men took a strike vote by secret ballot on Saturday night, May 9. The result was that 1,352 decided against a strike and 1,150 for a walkout. It would have taken a two-thirds vote to call a strike.

Mr. Stanley's refusal to sign a new contract with Division 268 was based on the grounds that the courts had held such a "closed shop" contract illegal. He voluntarily gave the men an increase of 5 cents an hour starting on May 1. The older men in the company's employ voted solidly against a strike.

For the present, the company likely will allow each carhouse to choose a representative as a member of a general committee to meet with company officials in matters of dispute. Later a permanent arrangement between the company and the men will be effected, but there will be no recognition of the union.

It will also no longer be necessary for new employees of the company to become members of the union within 60 days after getting work, nor will there any longer be arbitration of disputes between the company and men.

Mr. Stanley announces that there will be no discrimination against employees who belong to the union, but that the men themselves will have to decide whether they want to continue to belong to the union. They will not be compelled to retain membership.

Rockford in New Franchise Tangle

Members of the retiring City Council at Rockford, Ill., passed the revised ordinance granting the Rockford City Traction Company a franchise after Mayor Hallstrom warned them that a veto of that resolution would be his first official act in the new administration. Mayor Hallstrom was re-elected last month, although the particular franchise he advocated and made an issue in his campaign was rejected.

David D. Madden, Corporation Counsel, says the franchise was "junked" when the Mayor failed to sign it before the outgoing body adjourned *sine die*, but Col. Arthur E. Fisher, counsel for the railway, claims the Council is "a continuing body and the law gives the Mayor a certain length of time in which to consider the ordinance. Silence on his part, or failure to act within that time, makes the act valid. But he must veto it to make it invalid."

Arthur D. Mackie, speaking for the railway, answered the Mayor's complaint that sections were unfavored by him by saying that even more sections were unsatisfactory to the company, but that it was a "give and take" adjustment. Mr. Mackie said that unless the Mayor vetoed the franchise the traction lines would attempt to have its bondholders and operating management accept the franchise and place orders for some $350,000 street improvements which have been delayed pending the outcome.

Detroit Municipal Employees Receive 3-Cent Increase

An increase of 3 cents an hour is provided by the new wage scale for conductors, operators and bus drivers of the Detroit Street Railways, Detroit, Mich., the first increase of 1 cent an hour to become effective June 1. Increases of 1 cent an hour will also be applicable on July 1 and Aug. 1, making the total increase of 3 cents an hour to be added to the present rates of 62 cents, 68 cents and 70 cents an hour. Pay for overtime is increased 5 cents in all three grades, bringing the rate for overtime up to 80 cents an hour. It was further recommended that the working time of platform men be kept as nearly as possible within eight-hour limits.

The increase is the result of a conference at which were present members of the Detroit Street Railway Commission, executives of the Department of Street Railways and a committee representing the Amalgamated Association. Following the conference the proposition was submitted to the railway employees, who approved it unanimously at a meeting on May 9.

In response to former demands the men had been informed by the Mayor that nothing could be done until after May 1. The Mayor stated previous to the meeting at which the proposal was adopted by the men that if the agreement was approved it would become effective without a resulting increase in fares or the curtailment of service.

In connection with the wage increase it was brought out that the employees of the Detroit Street Railways were exempt from the regulation by the City Civil Service Commission, according to an opinion given by Paul T. Dwyer, assistant corporation counsel. Mr. Dwyer quoted from the public act adopted 1909, which states that each city may in its charter provide within a reasonable time after the acquisition of a public transportation utility that the officials in charge of the operation shall establish a system of civil service for the selection and retention of its employees. His opinion stated that until such time as the officials in charge of the Department of Street Railways establish a system of civil service or determine to subject the department to the Civil Service Commission, and the Charter is amended to provide civil service for the department, the Detroit Street Railways is not amenable to the civil service act.

Toledo Board Against Doherty Plan

Ultimate collapse of the transportation system in Toledo is foreseen by the Board of Street Railway Control unless officials of the city and the Community Traction Company take prompt measures to save the situation.

The board is emphatically opposed to the proposal of Henry L. Doherty for sale of $2,000,000 of 8 per cent preferred stock and shifting of control to Toledoans. It looks upon the plan as unsound and stands by its previous recommendation that there must be some specific plans for improved service, discharge of financial obligations by the company to the city, repair of tracks and streets, and lower fares. It holds that some changes must be made in the Milner ordinance.

The letter from the board received by Council on the evening of May 11 was referred to the railroads and telegraph committee. Mr. Doherty may be asked to come to Toledo in an effort to speed up some kind of settlement of difficulties.

Coincident with the presentation of the letter of the Street Railway Board of Control the City-Wide Motor Coach Company, headed by M. Wiener, Cleveland, asked for a 25-year franchise for a complete bus system to charge 5-cent fare with a 1-cent transfer charge. This plan was referred to the railroad committee for further consideration.

In its reply to the Doherty proposal the car board declared that the plan would not stand the test of sound banking principles. The board declared:

> Since the adoption of the Milner ordinance, interurban and city transportation methods have undergone radical changes. The more general use of automobiles has caused the average number of street car rides per inhabitant to be reduced.
>
> It is apparent that the fixed operating charges of the railway at Toledo are so large that even with high fares the earnings are not sufficient to comply with the ordinance requirements.
>
> Mr. Doherty proposed that Toledo citizens purchase preferred stock of the Community Traction Company, in the sum of $1,500,000; that he likewise invest an additional $500,000; that he turn over to Toledo investors the common stock of the Community Traction Company and that the operation of the railway be placed in the hands of the proposed local purchasers of stock and put under their control.
>
> It is possible that local control and operation of this property might result in securing an adequate system of transporta-

> tion with improved service, rehabilitated tracks and street pavements, and with reduced rates of fare. It is, however, certain that local investors would not be attracted to this proposition unless the capital structure of the company is changed so that the new money going into the property to rehabilitate it and provide for expansion will have a priority over the present bonded indebtedness, and further that there be an agreement providing essential modifications of the Milner ordinance.
>
> We cannot look with favor on the suggestion that Toledo citizens purchase $1,500,000 of the preferred stock of the company as we do not consider the investment either sound or attractive.

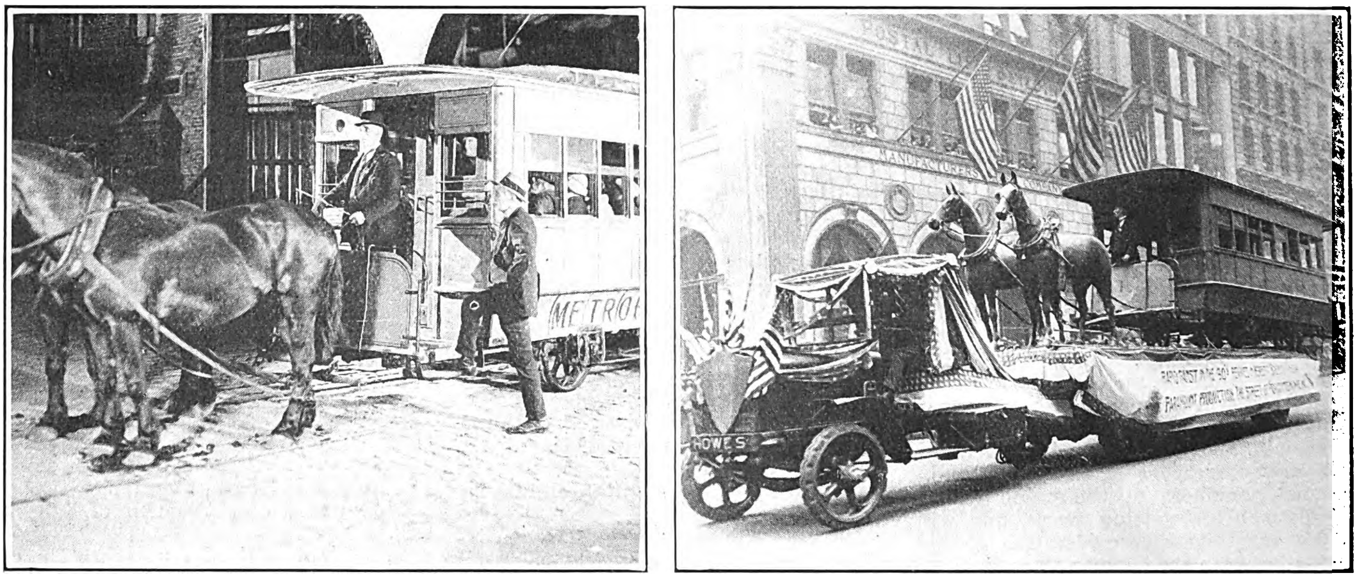
The board counsels the city and company to take prompt and drastic action to forestall the possibility of competitive transportation.

Frank R. Coates, who has represented Mr. Doherty in the negotiations, declared this attitude of the board against competition in the transportation for the city was a hopeful sign.

Safety Parade on Fifth Avenue

Barron G. Collier Stages Show to Impress Public With Need for Care—10,000 on Parade—Schools Suspend—Demonstration Regarded as Great Success

EVERYBODY except the right person appears to have got prominent mention in the New York newspapers in their accounts of the parade on May 11 that ushered in safety week. The name subordinated to others in most of the accounts was that of Barron G. Collier, special deputy police commissioner, the grand marshal. True, his picture along with that of Mayor Hylan and Police Commissioner Enright graced the official program and marching order, but as a newspaper personality Mr. Collier wasn't in it with Mayor Hylan shaking hands with Mrs. Joseph C. Conlon of Queens.



Horse Cars Resurrected to Show Evolution of Transportation

10,000 PERSONS PARADE

Mr. Collier conceived the parade with the hope of again bringing home to the public the message of safety and at the same time driving in a keener realization that the safety of the individual is interdependent with that of others. As he sees it the keystone of the work of the bureau is to install safety consciousness and to inculcate those principles upon which is based the greatest and most effective power which can be brought to bear upon the causes of accidents — carelessness. Hence the idea of the parade as a vehicle for attracting attention, getting newspaper space and driving home the message intended to be conveyed.

There were 10,000 persons in the parade. There were 115 floats, 55 of which were "safety first" creations, and there were 36 bands. Three thousand children were in the line of march. Conspicuous among the marchers was "Aunty Jay Walker," who disapproves so heartily of jaywalking. Another feature was Dick Collins, veteran Indian fighter, and his old ox cart.

There are no stouter adherents to the safety program than the electric railways and the steam railroads, and despite the physical limitations imposed by the equipment they operate these companies participated heartily in the program for the week and in the parade. In fact a section of the parade was arranged with the idea of showing the evolution of transportation, the pageant including the Indian with his pony, the early doctor's swayback horse, the ox cart, jaunting cart, Colonial coach, one horse shay, first horse car, the first trolley, the tandem, the first bicycle, the old Broadway squad, the hansom, the first motor, the first automobile truck, the automobile of 1912, the modern bus, taxicab and pleasure car. The increasing danger of the evolution of the means of transportation was emphasized throughout and the importance of "safety first" continually impressed.

The Second Avenue Railroad dug up from its museum of antiquity a horse car used in the parade and actually drawn by horses, while from another source a car was obtained to use on one of the floats. In the case of the car mounted on the float wooden horses were made to substitute real ones. Among other exhibits of particular interest were the following:

A float of the Long Island Railroad depicting the dangers of railroad grade crossings.

A miniature railroad grade crossing with crossing gates down, automobiles waiting at the crossing, and a working model of a steam locomotive with wheels running at the rate of 60 miles an hour just entering on the crossing. This float shown by the Pennsylvania Railroad conveyed the lesson of extreme care required when approaching railroad crossings.

A scenic painting showing a little girl who has fallen down on her hands and knees in front of an approaching automobile, the driver of which has brought it to a successful stop before striking the child.

Two buses loaded with 105 laughing school children testified to the statement that these children represent 105 boys and girls whose lives were saved from accidents by safety work in the schools last year.

"Crossings" — New York Central Lines float showing safety signals at railroad crossings. Embodies need of care at grade crossings.

"Dice"—National Casket Company. An enormous pair of dice bearing the grim message "Don't gamble with Death."

It is three years since Police Commissioner Enright placed in Mr. Collier's hands the great trust—the great task—of making the streets of the City of New York safe for pedestrian and motorist alike. These three years have been fruitful indeed.

The bureau of public safety of the Police Department is justly proud of its many accomplishments—of the service which it has rendered in the conservation of human lives—in the lessening of vehicular accidents. Credit for this record should go to Mr. Collier, perhaps, more than to any other individual. Mr. Collier, however, sees it more in this light:

> But it is to you—the people of our city who have made this record possible; who have realized that safety is a personal, an individual matter—that we give thanks and grateful acknowledgment. To you this parade is dedicated.

Connecticut Men Consider New Working Terms

Meetings of the executive board of the state trolleymen's organization have been held recently in an effort to whip into final form the new agreement to be submitted to the Connecticut Company, New Haven, Conn. The present agreement expires on June 1.

The present scale of wages is 53 cents an hour as the minimum and 60 cents an hour maximum with 7 cents additional for operators of one-man cars and time and a half pay for overtime work.

No indication has been given of the probable tenor of the request for a readjustment of the terms under which the men work at present.

One-Man Car Hearing in Dayton in July

The case to test the legality of the ordinance passed by referendum in 1923 abolishing one-man cars in Dayton, Ohio, will be heard by Judge Smith Hickenlooper in the United States District Court at Dayton on July 6.

Attorneys for the five railways aver that the referendum is unconstitutional. The railways are operating the one-man cars under an injunction granted by the court pending the final disposition of the case.

In the original petition, it was pointed out that an ordinance was passed by the City Commission in 1921 permitting the use of one-man cars. This ordinance was outlawed and a new one drawn in 1923 as a result of a referendum vote in which the public demanded the two-men cars.

Before the time for the ordinance to become effective the railways secured an injunction and since have operated the one-man cars.

City attorneys contend that a number of persons were injured because of the absence of the safety devices and that for this reason the cars were voted discontinued.

Fare Question Up in Dallas

C. W. Hobson, chairman of the board of the Dallas Railway, Dallas, Tex., says that the favorable decision in the Geller suit cleared up one point, but that the Dallas Railway cannot borrow new capital until the time limit is removed from the 6-cent fare. At present the company is operating under Everman plan No. 3, which grants a 6-cent fare until June, 1926.

Borrowing of new capital for the Dallas properties is regarded as necessary before the improvements sought by the city can be carried out. Under the franchise the city has exclusive control of the reserve funds, to which the earnings of the company go after the authorized return on the investment has been allowed.

Most of the reserves are practically empty.

The Geller suit contested the city's right to regulate fares. It was decided in favor of the Dallas Railway and the city. The court held, in short, that the question of the fare necessary to yield the company an adequate return is both a legislative and judicial question and one which the Board of Municipal Control is competent to decide without referring the matter to the voters.

Men in Oakland Want Wage Increase

May Day brought with it a demand from the 1,100 platform men employed by the Key System Transit Company, Oakland, Cal., for an eight-hour day and an increase in wages to $6 a day. The matter will go to conference.

George Durand, president of the local union, made this statement:

> Carmen work a ten-hour day. They receive 65 cents an hour, or about $145 a month. We feel, however, that we are entitled to an eight-hour day and a wage of $6 a day. The case concerns the public. No other organization in Oakland maintains the 10-hour day and only one or two businesses operate on a basis of more than eight hours.

In the event of disagreement at the present conferences, the men have the right to appeal to the board of directors, and after that contested questions may be decided by arbitration.

Light Up, Ladies!

The New York Transit Commission has granted the application of the Brooklyn City Railroad to permit smoking during the summer months in the rear part of the new type center-exit cars. The action was taken in the interest of comfort. Commissioner Harkness said:

> Smoking seems now to be more prevalent. Formerly women generally objected. Now I doubt whether the majority of women would object. It is probable that a sizable number of them would like to avail themselves of the permission now given to smoke in the rear part of the cars. If they so desire, I know of no law against it.
>
> Some years ago, smoking was allowed on the last car on elevated trains. This practice was done away with, but I am not sure but what it could not now well be restored.
>
> If, without increasing the difficulties of operation and without giving undue annoyance to others, more privileges can be allowed the riders as an offset to the present intolerable discomfort of riding, I am in favor of doing so. Of course, smoking in subway cars is out of the question.

The new cars will replace open bench cars on Flatbush Avenue and the company felt that it was highly desirable to continue the privilege of smoking on the new cars. Pictures of women indulging in the weed were taken for use in Pathé news.

Opening of Railway Celebrated at Coral Gables

Five new cars bought by the Coral Gables Corporation were put into service on April 30 over an extended railway which connects the city of Miami and the city of Coral Gables, Fla.

Upon the arrival of the cars at the terminus of the line at the administration building of the Coral Gables Corporation, they were met by a crowd of residents. William Jennings Bryan made the address of welcome.

It was significant that upon the opening of the new railway Coral Gables became a city through the enactment of a bill by the Florida Legislature. The occasion of the arrival of the cars was, therefore, a joint celebration, at which the new Mayor and the City Commissioners were introduced to the public.

The Mayors and the City Commissioners of near-by towns, the bank presidents, heads of Chambers of Commerce and other prominent citizens were the guests of the new Mayor of Coral Gables, Edward E. Dammers, and of George E. Merrick, owner and developer of Coral Gables, on the initial ride from the carhouse, located half way between Miami and Miami Beach, through the city of Miami and over the new line from Miami to Coral Gables.

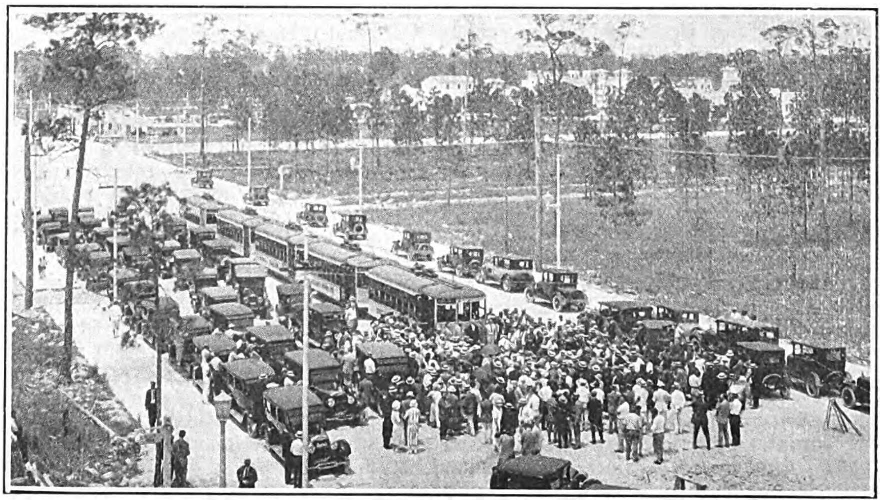
At the conclusion of the street car trip, the guests were taken in automobiles to the Miami-Biltmore Country Club in Coral Gables and were entertained by Mr. Merrick at luncheon.

C. D. Benson, city attorney, acted as toastmaster. Many speeches were made laudatory of Mr. Merrick.

Mayor Rumph of Miami presented Mayor Edward E. Dammers of Coral Gables with a key to the city of Miami.

A 5-cent fare is to be charged every person who rides in the Coral Gables trolleys to the city limits and another fare of 5 cents will be added for all persons who go beyond the city limits, making the fare to Coral Gables from Miami 10 cents.

The City Commissioners at Miami have approved an agreement between the Coral Gables Utilities Company, which owns the railway from Miami city limits to Coral Gables, and the Miami Beach Railway, which has contracted with the Coral Gables Utilities company to operate over this track.



Cars at Coral Gables on First Run

Recent Bus Developments

Indianapolis Street Railway Files Petition Under New Bus Regulation —Projects Reported from Many Quarters

PLANS of the Indianapolis Street Railway, Indianapolis, Ind., for an extension of bus operation as an integral part of its transportation system has become known with the filing of the company's petition before the Indiana Public Service Commission for a certificate of convenience and necessity under the new bus regulatory laws. Three lines radiating from Monument Circle in the center of the city and a feeder extension of the West Washington Street line are described in the petition. Fares will be the same as on the street cars, 7 cents in cash for a single fare, or 6¼ cents at the ticket rate, with 1-cent transfer and the privilege of transfer free from bus to bus or from bus to street car.

Two lines will run to the north side, the heart of the best residence district, and the traction company will start a campaign for leaving the family automobile at home, in view of strict parking rules in the downtown district. The company now is operating two bus feeder lines on the north side, one of which will be absorbed in the through service by the proposed north side line.

The Connecticut Company, Bridgeport, Conn., has been authorized by the Public Utilities Commission to operate east end, west end and north end crosstown bus lines in Bridgeport. Several independent bus companies had sought licenses to operate through the same sections. They were sponsored by Walter Lasher, president of the American Chain Company. He favored the 5-cent fare the buses would provide. The decision recently handed down by the commission has put an end to the controversy, and the railway will provide the service at the existing fare of three tokens for 25 cents, including transfers. J. B. Potter, manager, when approached recently, said the service would start on May 17. He expects nine new coaches to afford ample service for the present. In refusing the rival applications the commission brought out that without exception the independent bus lines sought to bring their routes through the center of the city. This would have duplicated the service provided by the railway.

City officials of Seattle, Wash., will meet in conference at an early date to study bus transportation as an adjunct to the electric railway system. This conference was decided on when the City Council utilities committee considered an application of Superintendent D. W. Henderson of the Seattle Municipal Railway for two additional buses. The city now operates fourteen buses, purchased at various times, singly and in twos and threes, and the Council believes the time has come for a comprehensive study of the matter of bus transportation. The two new buses to be purchased immediately will be used on the Empire Way line. There is now a petition before the City Council for municipal bus service to replace privately operated buses along Tenth Avenue Northeast and vicinity.

The St. Louis Bus Company, a subsidiary of the United Railways, St. Louis, Mo., has put into effect reduced fares for children, making the rate 6 cents for children under 12 years of age and no fare for those under 5 years and not occupying seats. The rate for adults is 10 cents. The rates of the United Railways on street cars are: Children under 12, 3 cents; adults, 7 cents. The St. Louis Bus Company and the United Railways interchange transfers.

Mayor Neal of Oswego, N. Y., recently authorized the Empire State Railroad to operate buses in Oswego. In approving the majority resolution following a conference with T. C. Cherry, vice-president and general manager of the corporation, Mayor Neal said that the company agreed to meet the cost of certain improvements and in addition promised to improve and extend the service. Mr. Cherry said that although the company was operating at a loss money was being expended for betterments. The Mayor said that he found the company willing to meet the city half way.

Bus operation was discontinued in Goldsboro, N. C., recently, following 30 days of running on a fifteen-minute schedule. H. G. Bales, operator of the line, claimed that the machines did not take in enough to pay for gasoline. He said that he would exchange the buses for vehicles suitable for intercity transportation. The railway in Goldsboro abandoned service some time ago on account of lack of patronage.

The Tri-City Railway, Davenport, Iowa, has suggested abandonment of its track on East Thirteenth Street and substitution of a bus system over the route, connecting with its other lines and operated on the same schedule. It is the first suggestion in the tri-cities of replacement of an electric railway route by buses.

The Windsor, Essex & Lake Shore Rapid Railway started a bus service on April 6 between Windsor and Leamington, Ont., a distance of 37 miles. The line is being operated as the Highway Motor Coach Line, with two Gotfredson sedan type twenty-passenger buses. The independent lines have since discontinued operation. The fares on the buses average 2¾ cents a mile, the same as on the street cars. Tickets are interchangeable.

The Illinois Commerce Commission has refused the Koenig bus line a rehearing for a permit to operate between Joliet and Forest Park. The commission several weeks ago ordered the line to suspend, at the same time granting the Chicago & Joliet Transportation Company, a subsidiary of the Chicago & Joliet Electric Railway, Joliet, Ill., a permit for the service. The Chicago & Joliet line, in addition to furnishing this service, issues transfers to its other city lines from the Forest Park route.

The Public Utilities Commission of the District of Columbia has authorized the Washington Railway & Electric Company to discontinue, temporarily, its through railway service between Massachusetts and Western Avenues and the downtown section during the paving and relocation of tracks on Wisconsin Avenue. The company has been authorized to operate a bus route between 45th and Fessenden Streets and Dupont Circle.

The California Railroad Commission has authorized the Los Angeles Railway to operate bus service along Florence Avenue from the city of Los Angeles to Huntington Park as an extension of railway service. The application of J. B. Simpson for a certificate to operate passenger buses between Huntington Park and Los Angeles, via Florence Avenue, has been denied by the Railroad Commission.

The Olean, Bradford & Salamanca Railway was recently authorized by the City Council of Salamanca, N. Y., to transfer the bus franchise which it was granted a few weeks ago to the Olean, Bradford & Salamanca Bus Lines, a subsidiary company, subject to the terms and conditions of the franchise. In authorizing transfer of the franchise Alderman Fuller's resolution specified that the new company was to be given an additional fifteen days, from the date of the transfer, in which to make application to the Public Service Commission for permission to run the buses, and was to put them into operation within 30 days after receiving such permission.

Sale of seven buses by the United Bus Transportation Company, operating between Elizabeth and Kenilworth, N. J., to the Public Service Transportation Company, a subsidiary of the Public Service Railway, was approved recently by the Board of Public Utility Commissioners. The board extended the purchaser the right to operate the buses over the same route. The Public Service Transportation Company also was granted permission to operate five buses on an extension of the Passaic-Garfield-Lodi route to Hackensack by way of Rochelle Park and Maywood.

The franchise for the new bus lines of the Portland Electric Power Company, Portland, Ore., has been sent to the City Council for approval, following a thorough survey of the territory by city and railway officials.

The Maryland Public Service Commission has received an application from the Blue Ridge Transportation Company, a subsidiary of the Potomac Public Service Company, for permission to operate a bus line from Westminster to Frederick, via New Windsor, Union Bridge, Libertytown and Mount Pleasant. The commission has set May 22 as the date for a hearing.

The Columbus Electric & Power Company, Columbus, Ga., plans to substitute bus service for the railway on the Rose Hill line and in Wynnton. Ten additional buses similar to the three now in operation on the Talbot Avenue line are expected within about 90 days.

The Boston & Maine Railroad has received the consent of the New Hampshire Public Service Commission to operate buses in Portsmouth as a substitute for the street cars of the Portsmouth Electric Railway, a Boston & Maine line.

Justice Wagner of the New York Supreme Court handed down a decision on May 11 in the cases wherein William J. Schieffelin of the Citizens' Union and Stewart Browne, as taxpayer, had obtained temporary injunctions restraining the city of New York from using municipal funds for the operation of buses in alleged violation of the law. Justice Wagner denied the motions of the plaintiffs to make the temporary injunctions permanent and granted the motion of the city to dismiss the two suits. From this decision an appeal will no doubt be taken to the Appellate Division of the Supreme Court, and after that, if necessary, to the Court of Appeals. The action in which the temporary restraining order was obtained on Jan. 20 last was directed against the appropriation of $164,000 for the 86th Street crosstown line. Justice Wagner held that the appropriation was constitutional under the home rule act.

Rumors have been revived concerning the transfer of the property of the Rapid Transit Company, Richmond, Va., to New York interests who now own some of its stock. It is said these interests will turn the property over to the Virginia Railway & Power Company to be operated in conjunction with its lines and with its proposed bus extensions now before the City Council of Richmond. The price is reported to be the sum invested in the concern, with 6 per cent interest. The amount involved is estimated at $200,000. Hearing on the proposed bus extensions by the railway has been held by the streets committee of the City Council.

Another Philadelphia Fare Hearing in June

Hearings were resumed on April 29 in the rate case of the Philadelphia Rapid Transit Company, Philadelphia, Pa., before the Public Service Commission, but at the close of the day the case was adjourned until the latter part of June. Argument was resumed after a petition had been filed by the United Business Men's Association looking toward restoration of the former fare of 6¼ cents. A rate of two rides for 15 cents was authorized last September by the commission. City Solicitor Gaffney said he would not be ready before the end of June to present the city's case because the Council had delayed the appropriation to meet the expense of further investigation. Only a few days before the hearing on April 29 did the finance committee approve the ordinance appropriating $40,000 to engage experts to examine the railway's accounts. Mr. Gaffney had asked for $75,000. There was a previous balance of $12,000 available for the work.

The only witness called was W. K. Myers, vice-president in charge of finance for the railway. He said that a return to the old fare would cut the company's income to $9,736,000, a sum inadequate for annual fixed charges.

Sioux Scale Unchanged

Members of the union and the Sioux City Service Company, Sioux City, Iowa, have agreed on the wage scale to be paid for the present. As a result there will be no change from the wage scale of 56 cents an hour.

Only one difficulty remains to be settled. The union men demand a twelve months contract. The company is willing to agree to pay the present scale as long as it is possible for it to do so, but declines to sign up for twelve months. The company said:

> Owing to the steady decrease in the number of riders the company finds itself unable to sign up for a definite length of time. We wish to continue the present scale as long as it is possible to do so, and will pay it for the entire year, if we can. Every unnecessary expense has been eliminated so there is little saving to expect from this angle. We feel that we should not cut service to the public in order to reduce operating expenses. Revenue is decreasing at a rate faster than ever before, and we cannot sign up for a twelve-month period when we do not know what the year will bring.

News Notes

Entertain Retiring Chief.—More than 300 employees of the Utah Light & Traction Company, most of whom were platform men, entertained in honor of H. F. Dicke, retiring general manager, at the carhouse in Salt Lake City, Utah, on April 29. The speakers paid glowing tributes to Mr. Dicke and expressed their regret at his departure, also assuring the co-operation of the men with Edward A. West, Mr. Dicke's successor. The employees presented to Mr. Dicke several valuable gifts.

Ten-Cent Rate Sought.—Abolishment of its 50-cent-a-month identification card system and substitution of a straight 10-cent fare with three tickets for a quarter, will be sought of the Illinois Commerce Commission by the Tri-City Railway. R. B. McDonald, general manager of the People's Power Company in Moline, Ill., indicated this move at a recent meeting of the Moline Council. The Tri-City Railway hopes to establish the same scale in Rock Island, Moline, East Moline and Silvis by July 1.

Eight-Cent Fare Extended. — The Missouri Public Service Commission on May 12 extended the present 8-cent fare base in Kansas City for a period of six months. The order was made on application of Receivers F. M. Wilson and Fred W. Fleming and the city through counsel agreed to six months extension of existing rates. Under the commission's previous order the schedule would have expired May 18. No definite period for the extension was named by the receivers in their petition to the commission. A letter from City Counselor Sollon T. Gilmore of Kansas City accompanied the application and stated that the city waived a hearing on the application and offered no objection to the extension of the existing rate of fares. However, the city asked that the extension be for not more than six months.

Seeks Relief from Paving Expenses.—The application of the Sherbrooke Railway & Power Company, Sherbrooke, Que., to the Quebec Public Service Commission for relief from excessive paving expenses in the city of Sherbrooke was heard on April 17 and the hearing was adjourned to May 20 at Montreal.

Will Vote on Transfer.—The City Council of Brandon, Man., recently passed a by-law to transfer the Brandon Municipal Railway to the Canada Gas & Electric Corporation for $50,000, subject to ratification by the ratepayers on May 19.

Franchise Agreement Reached.—The City Council of Quebec, Canada, and the Quebec Power Company have reached an agreement in the matter of a franchise for an electric railway held by the Quebec Railway, Light & Power Company. The new agreement is to run for 30 years from July 1. It provides for the use of one-man cars, the present rate of fare, school children's tickets, workmen's tickets and a revision of fares every 10 years. The city is to give the company preference in the construction of subways or elevated railways or the use of buses. The matter had been under discussion for about a year, but it was not until March 19 that negotiations reached the stage to permit a tentative contract to be drawn.

Franchise Question Up.—The renewal of the franchise of the Niagara, St. Catharines & Toronto Railway will be before the City Council of St. Catharines, Ont., within a few weeks. The company, in return for improvements to track and service, is seeking a twenty-year franchise.

More One-Man Cars in Springfield.—Under the new schedules of the Springfield Street Railway, Springfield, Mass., effective May 10, one-man car service replaced two-man car service on most of the city lines during the greater part of the day. On a number of routes two-man service will be in force during rush hours only. The plan calls for the operation of only fifteen two-man cars all day on city lines.

New Cars Inspected. — The Grand Rapids Railway, Grand Rapids, Mich., recently parked its three test coaches, the Minnesota, St. Louis and Ohio, on a downtown siding. Hundreds passed through the cars and the points of difference and the advantages were explained by attendants. By way of contrast, one of the ancient horse cars and an equally ancient horse also were exhibited. In addition the story of the three new cars was broadcast from Schenectady and Detroit. The Schenectady broadcasting was amplified from a building adjacent to the siding so that the public might further learn about the new cars. The cars have been placed in regular service and now are on the various railway lines, tests being made on all to determine operating costs and efficiency of operation. The Minnesota was described in the ELECTRIC RAILWAY JOURNAL, issue of March 28, page 529.

Men Reject Compromise Offer.—Members of the Peoria carmen's union have rejected a 2-cent compromise wage increase submitted by the Illinois Power & Light Corporation to its demand for a 10-cent increase. Henry Mansfield, for the union, and Eugene E. Soules, for the company, are acting as mediators to effect a new scale.

Financial and Corporate

Earnings Keep Up

Newport News Company Reports a Surplus in 1924 After Depreciation Reserve of $49,793

Operating revenues of the Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., for the year 1924 were $1,987,214, a decrease of $112,833 over the earnings for 1923. The operating expenses of the company were $1,223,313, a decrease of $113,342 over the expenses for 1923. Taxes for the year were $123,653, or $2,090 more than the previous year, due to an increase in the federal income tax. Non-operating revenues for the year were $3,561, an increase of $362 over the year 1923. Income reductions were $248,515, or $5,672 less than in 1923.

After all charges the balance available for depreciation, dividends and surplus was $395,293. This is an increase of $4,453 over the year 1923.

SUMMARY OF OPERATIONS OF THE NEWPORT NEWS & HAMPTON RAILWAY GAS & ELECTRIC COMPANY FOR TWELVE MONTHS ENDED DEC. 31

Gross Earnings:	1924	1923
Transportation	$505,836	$541,277
Gas, lighting and heating	336,014	346,908
Electric light and power	766,868	794,193
Ice, coal and wood	378,496	417,670
Total, earnings	$1,987,214	$2,100,048
Operating expenses:		
Transportation	$382,129	$424,614
Gas, lighting and heating	197,372	215,654
Electric light and power	320,642	354,507
Ice, coal and wood	323,170	341,881
Total expenses	$1,223,313	$1,336,656
Net earnings	$763,900	$763,391
Taxes	123,653	121,562
Income less operating expenses and taxes	$640,247	$641,828
Non-operating revenue	3,562	3,199
Gross income	$643,809	$645,027
Income deductions	248,515	254,187
Net income	$395,293	$390,840
Dividends declared during year	245,000	245,000
	$150,293	$145,840
Amount set aside for depreciation reserve	100,500	100,000
Corporate surplus	$49,793	$45,840

J. N. Shannahan, president, explains that the decrease in gross earnings was due to the continued inactivity in business, caused by the reaction from war conditions and the reorganization of important business factors of the community necessary to meet the changed conditions. Mr. Shannahan points out, however, that the decrease in operating expenses more than offset the decrease in revenue. While part of this reduction was brought about by lower cost of fuel, the greater part of the saving was effected by careful elimination of small items of expense without lowering the standard of maintenance.

Recognizing the fact that bus operation is a necessary adjunct to the street railway, in November of 1924 the company purchased the entire capital stock of the Citizens' Rapid Transit Corporation, which operated five buses in Newport News in competition with the railway. This operation is being continued as a part of the transportation system and it is planned later to replace the present bus equipment with the standard railway type of bus.

Four quarterly dividends of 1¾ per cent were paid on the preferred stock of the company and four quarterly dividends of 1¼ per cent were paid on the common stock of the company.

The management feels that the business outlook in the territory served is better than it has been for the past three years.

The statement of improvements and betterments shows that $55,033 was spent on the railway properties. This total included $13,350 for five Reo buses, $37,659 for two steel barges and $2,801 for equipping six cars with safety car control.

Tentative Price Fixed for Rainier Valley Property

The Seattle & Rainier Valley Railway has submitted to the city of Seattle the sum of $1,500,000 as a tentative price for purchase of the line by the city. The offer provides that payment be made by the city in twenty-year bonds bearing 5 per cent interest. This price carries with it no pledge that the company need accept, the sum merely representing the amount President Brown decided to recommend to the company's bondholders in the East, with whom the final power to accept reposes. The sum named is nearly $500,000 higher than the value of $1,045,547 shown by the appraisal of city officials. The figure suggested by Mr. Brown corresponds to the valuation of $1,507,470 as of Dec. 31, 1922, placed on the properties by the State Department of Public Works. This value did not include stores and non-operating property. At the suggestion of the City Council, Mr. Brown has agreed to ascertain whether his company will accept 30-year bonds instead of bonds drawn to mature in twenty years.

Kansas City Bondholders Act

Representatives of the Holders of the First Mortgage Securities Seek an Order of Sale—Second Mortgage Holders and Mr. Armour Remain Unplacated

An ORDER was submitted on May 11 for the sale of the Kansas City Railways, Kansas City, Mo., under foreclosure. At the same time it was revealed by the holders of the first mortgage that it was not their purpose to include a reorganization scheme in the decree of foreclosure.

The decree was submitted to Judge Kimbrough Stone, referee. As submitted, it omits the mention of the minimum price above which the property must be sold and leaves the date of the sale to the master, named by Judge Stone. Up to the time that a recess was taken, there had been no discussion of the decree by representatives of J. Ogden Armour or of the second mortgage bondholders, none of whom is said to agree with the present plans of the reorganization managers.

H. R. Platt, attorney for the first mortgage bondholders, has been credited with the statement that he understands that a plan for reorganization, which has been "largely agreed upon," is in existence, but no such plan has yet been advanced openly. In the opening discussion Mr. Platt intimated that it would be the policy of his constituents to submit a reorganization plan for the approval of the court at the time the sale shall come up for final sanction. That may be several months from now.

A valuation of the railway now under way will not be finished until Aug. 1, according to the most recent estimates.

It is said that the $2,000,000 claim of J. Ogden Armour and the claims of the second mortgage bondholders constitute the cause for the careful procedure at the hearing by the trustees of the first mortgage. The holders of the second mortgage bonds are reported to have had the opportunity some time ago to settle their accounts for 20 cents on the dollar, but refused the offer. So far as is known, Mr. Armour has never received any definite offer of adjustment of his claim.

According to Mr. Platt, the railway could not now be sold for the amount of its bonded indebtedness. He argued that neither Mr. Armour nor the second mortgage bondholders had any real interest in any minimum sale price which the court might set, because, with deferred interest, $33,500,000 is now due on the first mortgage.

The 1924 earnings of the railway are said to have been $1,057,000. Mr. Platt designated this as a 3 per cent gross return from a $33,500,000 investment, disregarding depreciation and franchise obligation costs.

Appearances would indicate that it was the purpose of Mr. Platt, in attempting to eliminate the second mortgage holders, to restrict these holders as much as possible. In explaining the language of the draft of the decree, Mr. Platt said that in the interest of peace and harmony, it became necessary to consult a large number of lawyers, many of whom had insisted upon rewriting paragraphs to conform to their own prejudices in the matter of diction. He admitted that so far as the phraseology went the resulting decree was rather inelegant.

The hearing appeared to indicate that those on the inside of the railway's affairs do not expect an immediate termination of the receivership.

Although Mr. Holt, attorney for Mr. Armour, is not known to have said anything at the hearing which might indicate that his client has any intention of appealing from any decisions of the present receivership, he showed particular interest in the matter of the records of the hearing. The city clerk having withdrawn the franchise document after he gave his testimony, Mr. Holt was successful in indicating clearly that a franchise of this kind exists between the city and the railway.

Many other matters were taken up during the opening session. This allowed only enough time for the statement of Mr. Platt. Mr. Armour was ordered to be paid $102,931 as a refund on money which he had advanced for surety bonds early in the receivership.

City May Take Phoenix Railway

The City Commission at Phoenix, Ariz., and the State Corporation Commission are considering plans under which Phoenix may continue service by street car in the event of expected abandonment by the Phoenix Railway in October. All bus applications will probably be held in abeyance. One plan, stated by City Manager L. B. Hitchcock, is for the city to purchase the trackage and rolling stock. Thereafter, while maintaining service, efforts would be made to find a purchaser or operator. Special mention was made of the necessity for operation of the three main lines, with possibility that sections of the city not reached by them economically could be served by bus lines. Included in the changes may be any increase in the fare from 5 cents to 8 or even 10 cents.

Refinancing Talk at Binghamton

Negotiations are pending between representatives of the Binghamton Railway, Binghamton, N. Y., and financiers in Binghamton and New York for the reorganization and refinancing of the company. This announcement followed the passing of interest due on May 1 on bonds of the railway. The plan of reorganization will probably be made public upon the return of Mortimer B. Fuller, president of the International Salt Company, from Europe. An official statement says in part:

> The Binghamton Railway failed to pay the interest on consolidated 5 per cent bonds due on May 1. The principal of the bonds, aggregating $600,000, will become due and payable on June 1, but no definite provision has as yet been made for the payment of this principal or for the extension of the loan. The company has been obliged to pay large sums for paving expenses and gross earnings taxes, which are long past due, and has been called upon to meet other extraordinary expenditures.
>
> While the 7-cent fare recently granted has improved the financial condition of the company, the maturity of these bond issues and the necessity for large expenditures, among them the purchase of additional cars, make necessary the immediate refinancing of the company on a sound and permanent basis which will provide for these securities and enable the company to take care of its current obligations and give it a reasonable amount of working capital.

It is said that the refinancing will be along two distinct channels. One plan presupposes the willingness of Mortimer B. Fuller to shift his holdings of stock to other hands, in which event the new owner would carry on the proposed refinancing by taking up the principal of $600,000 payable on June 1 and also pay the interest due on these bonds May 1. The other plan would contemplate financing under the direction of Mr. Fuller that would look toward the payment of the principal and interest. Of the many rumors that have grown out of the discussion of the affairs of the company one is to the effect that the road may be placed under the direction of the J. G. White Management Corporation, New York.

Unregulated Jitney Competition Decreases Traffic in Atlanta

After payment of operating expenses, taxes, rentals and interest the balance from 1924 operations of the Georgia Railway & Power Company, Atlanta, Ga., was $2,474,728 and after the payment of sinking funds, $2,211,471.

The total mileage of street railway tracks (on a single-track basis), on Dec. 31, 1924, owned or leased and controlled and operated by this company, exclusive of the street railway system at Gainesville, Ga., which was sold in July, 1924, to the Gainesville Railway, was 245 miles.

The number of passengers carried on the city and suburban system, on the Stone Mountain line and on the Atlanta Northern Railway, which is the interurban line between Atlanta and Marietta, for each of the last four calendar years is shown herewith.

The decreases in passengers carried on the city and suburban system and on the Atlanta Northern Railway in 1924 as compared to 1923 were due to unregulated jitney and bus competition in the city of Atlanta and between Atlanta and Marietta, paralleling the Atlanta Northern Railway. In the latter part of January, 1925, the city of Marietta, served by the Atlanta Northern Railway, adopted an ordinance eliminating the duplication by bus of the service furnished by that line.

At a meeting of the General Council of the city of Atlanta on Feb. 2, 1925, an ordinance was adopted prohibiting the operation of jitneys and buses on streets where street cars are operated. With this ordinance enforced the number of passengers carried for 1925 should show an increase over 1924.

For track and roadway improvements the Georgia Railway & Power Company spent $2,443 during the year.

For the purpose of constructing and acquiring new and additional property or reimbursing the treasury for new and additional property already acquired, there were issued during the year $2,919,000 par value Georgia Railway & Power Company first and refunding mortgage bonds. The bonds so issued, together with 81 bonds held in the treasury, or a total of $3,000,000 first and refunding mortgage bonds, were deposited with the trustee under the general mortgage and there were issued against the same $3,000,000 30-year 6 per cent general mortgage gold bonds, series 1924. The $3,000,000 general mortgage bonds so issued were sold and $2,122,000 of the proceeds deposited with the trustee under the first and refunding mortgage to cover future construction and the balance placed in the treasury.

As authorized by the stockholders at a special meeting on July 29, 1924, the company issued and sold at par $2,500,000 first preferred cumulative stock, 7 per cent, series 1924, the proceeds of which were placed in the treasury of the company to be used or applied only for the acquisition or construction of new and additional property or reimbursing the company for expenditures made for new and additional property.

President of Market Street Railway Ready to Sell

Mason B. Starring, president of the Market Street Railway, San Francisco, Cal., says:

> If San Francisco desires to purchase the Market Street Railway at a fair price, and I have too much respect for its integrity to anticipate that it will attempt anything else, the opportunity shall be given it.
>
> As I now understand it, San Francisco seems irrevocably committed to municipal ownership, and I have no desire to run contrary to the wishes of the community.

INCOME STATEMENT OF GEORGIA RAILWAY & POWER COMPANY AND LEASED AND SUBSIDIARY COMPANIES

	1924	1923
Operating revenues	$16,179,766	$16,006,928
Operating expenses	9,813,374	10,195,923
Net operating revenue	$6,366,391	$5,811,005
Less taxes	1,052,292	990,940
	$5,314,099	$4,820,064
Other income	686,483	553,106
Gross income	$6,000,582	$5,373,171
Bond interest and rental dividends of leased and subsidiary companies	1,830,928	1,717,707
	$4,169,653	$3,655,463
Other interest of leased and subsidiary companies	330,029	245,675
Extinguishment ofdiscount on securities of leased and subsidiary companies	12,493	10,603
	$342,523	$256,278
	3,827,130	3,399,184
Bond interest Georgia Railway & Power Company	1,197,085	892,176
	$2,630,045	$2,507,008
Interest on notes Georgia Railway & Power Company	102,546	37,392
Extinguishment of discount on securities Georgia Railway & Power Company	52,770	33,377
	$155,316	$70,769
Net income for the year before depreciation and dividends	$2,474,728	$2,436,238

STATEMENT OF PASSENGERS CARRIED

	1921	1922	1923	1924
City and suburban system	91,358,479	92,172,664	93,357,117	92,029,437
Stone Mountain line	672,741	557,274	634,014	640,634
Atlanta Northern	1,178,852	1,131,278	1,218,697	1,202,985

Valuation Hearing Begun at Baltimore

A hearing to determine the valuation of the property of the United Railways & Electric Company, Baltimore, Md., opened before the Maryland Public Service Commission on May 4. It continued for four days and then was adjourned to be resumed on May 13. The case opened with arguments by William H. Maltbie, representing the company, and Clarence W. Miles, counsel for the people. The first witnesses were called for the United.

During the course of the hearing C. D. Emmons, president of the United, made a statement to the effect that the company is not planning to ask an increased fare at present. Mr. Emmons said:

> The company has no idea at the present time of claiming an increased fare. For some years past it has been perfectly well known to the officers of the company and to its board of directors that the company was not earning a fair and legal return upon the value of its property, but at no time has court action been suggested to obtain this return.
>
> We have our interests in the city of Baltimore, just as every one else here has, and it has been our earnest desire to keep the fare down to the lowest possible point based on good service. We see nothing to suggest a change in this policy unless unexpected circumstances arise or demands come upon us from quarters over which we have no control; such incidents as a change in the purchasing power of the dollar, increased demands from the tax collector or other items of a substantial nature which must be taken directly out of the car fare.
>
> The company is running on too low a return on its value, but we look to the future growth of the city rather than to a present increase in the car fare for our reward.

Excellent Showing Made in Schenectady

The most favorable report in many years was filed with the Public Service Commission by the Schenectady Railway, Schenectady, N. Y., for the first quarter of 1925. The net loss for the first quarter of 1924 was turned into a net profit this year. While the operating revenue remains about the same the operating expenses have been reduced by nearly $93,000. The statement follows:

	1924	1925
Operating revenue	$469,943	$467,664
Operating expenses	441,210	348,541
Net revenue	$28,734	$119,123
Tax	28,026	25,354
Operating income	$708	$92,369
Non-operating income	516	590
Gross income	$1,224	$93,959
Fixed charges	47,825	57,712
Net corporate income	$46,601*	$36,247

*Loss.

Commonwealth Power-Tennessee Electric Merger Proposed

G. E. Hardy, president of the Commonwealth Power Corporation, states that the directors have authorized the submission of the plan for acquisition of control of the Tennessee Electric Power Company, Chattanooga, Tenn., operating several electric railways, by exchange of stocks, under which on consummation the second preferred stock of the Tennessee company will receive preferred stock of the Commonwealth Corporation on the basis of share for share and the common stock of the Tennessee company will receive for each share 35/100 of a share of preferred stock and 25/100 of a share of common stock of the Commonwealth corporation.

Mr. Hardy further states that holders of substantial amounts of the Tennessee stocks have already agreed to exchange under the plan. The proposal is now in process of preparation and a statement of all the details will undoubtedly be issued in the near future.

Issue of Mortgage Bonds Approved.—The Public Service Commission has authorized the Savannah Electric & Power Company, Savannah, Ga., to issue $1,200,000 of first and refunding mortgage bonds to reimburse the treasurer for expenditures to the physical property.

Bond Issue for Improvements.—The Dayton, Covington & Piqua Traction Company, Dayton, Ohio, is arranging a bond issue of $100,000, the proceeds of which are to be used to rehabilitate the tracks and line and the rolling stock.

Dissolution Final.—Final order of dissolution of the Aurora, Plainfield & Joliet Railroad, Joliet, Ill., has been issued by the Secretary of State. The railway ceased operations last August and established a bus service over the route under the name of the Aurora, Plainfield & Joliet Transportation Company. The abandonment order was issued last July, but the commission retained jurisdiction over the road to enable Joliet and Plainfield municipalities to collect their paving assessments. The company was formed in 1901. Financial difficulties began with a tragedy near Joliet that resulted in damage awards which forced a receivership. The western division was sold by the master to the bondholders, who attempted rehabilitation. The Joliet-Chicago Heights line was junked.

Deficit Lower.—For the three months ended March 31, 1925, the operating revenue of the International Railway, Buffalo, N. Y., was $2,568,482, against $2,599,338 for a similar period of 1924. Operating expenses and taxes fell from $2,412,380 in 1924 to $2,308,261 for the three months period of the present year. After allowing for income deductions a deficit of $115,144 remained for this year's period, against a deficit of $196,721 for the first three months of last year.

P. R. T. Calls Notes.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., has called for redemption on June 1 its two-year 6 per cent gold notes at 100¼ and accrued interest.

City May Take Railway.—Mayor Kendrick of Philadelphia, Pa., has sent a communication to Council in which he pointed out the advantages of ownership of the Frankford, Tacony & Holmesburg Railway. Hamilton Disston and Henry J. Rebman, the receivers, have expressed the opinion that at the receiver's sale, June 15, the bondholders' protective committee would agree to an upset figure of $350,000 if the city bids for the property. The Mayor has suggested that it might be more economical to purchase the line than to construct a new line, as originally contemplated. The Mayor showed that the cost of rehabilitating the railroad would be about $450,000. Informally, he said, the Philadelphia Rapid Transit management had expressed its willingness to operate the line if so desired by the city.

Rutland Road Sold.—The Burlington Paper Stock Company has completed negotiations for purchase of rails, wires and equipment of the Rutland Railway, Light & Power Company, Rutland, Vt., for $18,000. The purchasers are to junk the property. The Rutland Railway Light & Power Company abandoned the lines late in December, 1924. Rutland is a city of 15,000. The railway operated 30 miles of track.

Council Sanctions Abandonment Appeal.—A resolution of the Bowling Green Council has been filed with the Public Utilities Commission recommending approval of the application of the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, for permission to discontinue service between Bowling Green and Pemberville. Abandonment of the line is sought so that the tracks may be removed from East Wooster Street, Bowling Green and the streets paved.

Reorganized Company Does Well.—The New York Railways, New York City, which recently emerged from a six-year receivership, earned $1,322,092 in the nine months ended March 31 applicable to charges. This compares with $585,076 in the nine months of the preceding year. Gross income declined, however, from $6,733,977 last year to $6,036,186 for the nine months ended March 31, 1925. Operating expenses and taxes for the nine months were $5,063,857, compared with $6,598,171. Operating income was $972,329 against $135,806. Gross revenues in March were $663,915, compared with $736,260 a year ago; operating expenses and taxes $559,194, against $726,473; operating income $104,721, against $9,787, and income before charges $134,568, against $49,165. The nine months' results show interest requirements for the entire year totaling $1,005,500 on $19,353,000 underlying mortgages of the reorganized company covered by an ample margin, and indicate earnings for the fiscal year ending next June 30 above 4 per cent on the $19,435,472 of new income bonds.

Discontinuance Authorized. — The Indiana Public Service Commission has granted a petition of the Union Traction Company for permission to discontinue interurban service between Anderson and Middletown. The company was instructed to file a separate application for permission to establish a bus route to take the place of the traction line.

Ninth Avenue Holders Agree.—Under a plan of reorganization agreed to by the protective committee representing the first mortgage 5 per cent, bonds of the Columbus & Ninth Avenue Railroad, New York, each bondholder will receive, upon final adoption of the plan, $416.66 principal amount of income bonds and 2½ shares of preferred stock of the New York Railways Corporation for each $1,000 bond deposited.

Personal Items

D. A. Belden Heads Holding Company

David A. Belden has been elected chairman of the board of the Community Power & Light Company, St. Louis, Mo., which owns and controls various lighting, power, gas, water and artificial ice properties in Missouri, Kansas, Texas and Arkansas.

Mr. Belden is widely known in the electric railway and the central station fields. From 1894 to 1901 he was general manager of the Aurora Street Railway, Aurora, Ill., and other traction lines in that vicinity. He next became general manager of the Georgia Railway & Electric Company, Atlanta, but left there in 1903 to become general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala. In 1905 he was elected president of the New Hampshire Electric Railways and subsidiary companies, including traction and lighting properties in the Haverhill, Mass., and Portsmouth, N. H., territory. Mr. Belden was born in Aurora in 1868. He was educated at Racine College in Wisconsin.

Mr. Belden was president of the Massachusetts Street Railway Association in 1915-17 and was a member of the special commission appointed in 1919 to investigate Massachusetts traction conditions.

Jilson J. Coleman Promoted

Jilson J. Coleman, manager of the Scranton Railway, Scranton, Pa., for the past five years, has been promoted to the position of operating vice-president. He will continue his duties as general manager. This was announced by the directors of the General Engineering & Management Corporation of the A. E. Fitkin interests in New York, recent purchasers of the Scranton Railway.

Mr. Coleman started railway work in Louisville, Ky., in 1882 as a clerk with the Central Passenger Railway. He worked his way up to the position of chief clerk and then managed the lines in New Albany, Ind. Later he moved to Cleveland and became identified with Tom L. Johnson and assisted in electrifying the horse-car lines. After that work was completed, Mr. Coleman helped to build the line from Allentown to South Bethlehem and from Allentown to Catasauqua. The company at Allentown purchased the line from Allentown to Bethlehem and consolidated the two companies. He was engaged in the work of rehabilitating the Yonkers system and in 1895 started the Nassau Electric Railroad, Brooklyn, N. Y., now included in the Brooklyn-Manhattan Transit Corporation. He managed the consolidation of the St. Louis and Washington systems for Brown Brothers, New York bankers. He next built the line of the New Jersey & Pennsylvania Traction Company, between Trenton and Princeton. From 1918 to 1920 Mr. Coleman was district engineer of the Passenger Transportation Division of the United States Shipping Board, Emergency Fleet Corporation, under A. Merrit Taylor, former transit commissioner of Philadelphia. This position carried with it the responsibility of seeing that adequate transportation was provided for the ship builders in the territory extending from Boston, Mass., to Houston, Tex.

New Key System Superintendent of Equipment

W. P. Jackson has been appointed superintendent of equipment of the Key System Transit Company, Oakland, Cal., in charge of all mechanical matters, with jurisdiction over the maintenance of rolling stock and floating equipment, reporting to the chief engineer. He succeeds George St. Pierre, who has retired after 39 years of service.

W. P. Jackson

Mr. Jackson joined the forces of the San Francisco-Oakland Terminal Railways in 1906 as assistant master mechanic. In 1914 he became master mechanic and now becomes superintendent of equipment of the successor company, the Key System Transit.

Mr. Jackson was born in Marion, Ind. At the age of seventeen he started to work as an apprentice with the Columbus Railway, Columbus, Ohio. He served with that company in the armature room, machine shop, foundry, truck room and car winding department. He then became general superintendent of the Marion Street Railway, Marion, Ohio. There he remained for six years.

After leaving Marion he became division superintendent of the Union Traction Company at Anderson, Ind., holding this place for one year. Later he was general superintendent of the Bay City Traction & Electric Company in Michigan and master mechanic for the Saginaw Valley Traction Company. Three years later he returned to Marion as master mechanic.

Mr. Alberger Resumes His Duties

W. R. Alberger has once more assumed his duties as vice-president of the Key System Transit Company, Oakland, Cal., after an extended trip of observation in the East and the Middle West.

During his trip Mr. Alberger made a study of the bus problem for his company and also made a survey of the fare situation. In speaking of the recent changes in personnel in his company Mr. Alberger explained:

> We have simply put young men on the firing line, where they belong, and older men, like myself, have been given easier berths. It is a good policy.
>
> I am still an official in the Key System Transit Company and expect to continue indefinitely in my present capacity.

R. C. Havens has resigned as manager of the Grand Rapids Safety Council to become safety manager of the Grand Rapids Railway, Grand Rapids, Mich.

J. E. Hill has been made general manager of the Eastern New Jersey Power Company and its subsidiaries, the Coast Cities Railway and the Atlantic Coast Transportation Company. He has had wide experience in the electrical field. A little more than a year ago Mr. Hill was made manager of the Monmouth Lighting Company, with headquarters in Keyport, N. J.

M. S. Casey of the St. Louis office of the Illinois Traction System has been assigned to the Decatur, Ill., district as district passenger agent to take over the work of developing the system's traffic. This work has been done by Lloyd C. Bundy, in addition to his other duties. The action has established Decatur as a district office for the company.

Albert B. Hoffman has been elected a vice-president of the Security Trust Company, Detroit, Mich. The Security Trust Company is one of the receivers of the Detroit United Railway, and Mr. Hoffman is the officer of the trust company most actively interested in representing the interests of the receiver in the railway.

John W. McCardle, serving his third term as a member of the Indiana Public Service Commission, has been elected chairman of the commission to succeed Samuel B. Artman, chairman last year. Mr. McCardle was appointed under Gov. James P. Goodrich. He became vice-chairman and was reappointed by Gov. Warren T. McCray. On May 1, 1921, when he began his second term, he was elected chairman to succeed Ernest I. Lewis. He continued as chairman until the election of Mr. Artman. Mr. McCardle was formerly a member of the Indiana Board of Tax Commissioners.

George St. Pierre, connected with the local railways at Oakland, Cal., for 39 years, and for many years superintendent of equipment for the Key System Transit Company, has retired from active service with the company. Mr. St. Pierre is from Montreal, where he served his apprenticeship as marine machinist. He began work with the traction company in Oakland in April, 1886. To show their appreciation of him, the employees of the Key System gave a banquet in his honor. Representatives from all departments were present. James P. Potter, superintendent of transportation, was toastmaster for the evening. The employees presented to Mr. St. Pierre a set of diamond cuff links as a token of esteem. He will retire to his farm near Walnut Creek.

Aubrey Beattie, an engineer on the staff of the Cape Breton Electric Company, Sydney, N. S., has been transferred to Beaumont, Tex., where he will be assistant superintendent of the Eastern Texas Electric Company. Both the Cape Breton Electric Company and the Eastern Texas Electric Company are directed by Stone & Webster. Mr. Beattie is a native of Amherst, N. S., and was attached to the staff of the Cape Breton Electric Company for 2½ years. He was graduated from the Nova Scotia Technical College and the McClellan School of Applied Science at Sackville, N. B.

Ralph Peters has resigned as superintendent of the Long Island Railroad to become an assistant vice-president of the Corn Exchange Bank. Mr. Peters entered the service of the road in 1910. On Oct. 1 of that year he was made assistant engineer in the construction department. Following a series of promotions he was made superintendent on July 1, 1923.

E. B. Kessler will succeed Ralph Peters as president of the Long Island Railroad. He became identified with the Long Island as general yardmaster on April 16, 1907, and became an assistant superintendent on July 1, 1923.

A. W. Koehler has resigned as director of safety of the New York State Railways, Rochester, N. Y., to accept a position as superintendent of accident prevention of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., effective on June 1. Mr. Koehler has an extended and successful experience in safety work. For two years previous to joining the staff of the State Railways he was executive secretary of the Rochester Safety Council, which is affiliated with the National Safety Council. During the previous five years, with the exception of a period of war service in the engineering department of the Navy, he was engaged in safety work with the Commonwealth Steel Company, Granite City, Ill., and the Atlantic Steel Company, Atlanta, Ga. Mr. Koehler was graduated in mechanical engineering from Purdue University in 1915. He was editor of the New York State Railways Magazine called "Transportation." His successor at Rochester has not yet been announced.

John H. Truett, safety director and chairman of the safety committee of the United Railways & Electric Company, Baltimore, since July, 1919, relinquished these duties recently and accepted the position of director of the Baltimore Safety Council.

William F. Hanna, secretary of the safety committee of the United Railways & Electric Company, Baltimore, Md., since its formation in July, 1919, has been appointed safety director of the company to succeed John H. Truett.

Clyde H. Jones has succeeded Maurice Douglas as a member of the Indiana Public Service Commission.

Obituary

Milan R. Bump

Milan R. Bump, chief engineer for Henry L. Doherty & Company, New York, and former president of the National Electric Light Association, died on May 5 at Denver, Col.

From 1910 to 1915 Mr. Bump was engaged largely in examining for purchase and improving many of the public utility properties which now make up the subsidiaries of the Cities Service Company. He had charge of all engineering and of the construction and operating departments of the public utility division, later becoming a member of the executive committee of the Doherty organization and assuming charge of oil transportation, the refining and marketing divisions and the natural-gas division, in addition to the engineering and technical activities of the organization. He was an officer, a director or both of many properties.

In 1915 Mr. Bump interrupted his service with the Doherty organization and became vice-president of the Eagle-Picher Lead Company in Joplin, but he soon returned, largely on account of missing the close associations and friendships he had formed.

In 1904 Mr. Bump became associated with Henry L. Doherty as the first cadet engineer of the Doherty training schools. From 1904 to 1906 he was engineer for the gas department of the Denver Gas & Electric Light Company, one of the first Doherty properties; from 1907 to 1909 he was examining engineer for Henry L. Doherty & Company, and in the latter year he removed to Joplin, Mo., where he was instrumental in consolidating electric utilities of the lead and zinc district and forming the Empire District Electric Company, of which he became treasurer and general manager. He also designed and erected a large modern steam plant and an extensive transmission system covering the entire mining field. In 1910 Mr. Bump was transferred to New York as chief engineer of all the Doherty interests.

Mr. Bump was born at Rock Falls, Wis., March 18, 1881. His boyhood was passed in Spokane, Wash., where he received his early education in the public schools. He entered the University of Wisconsin in the fall of 1898 and was graduated with a degree of B.S. in electrical engineering in 1902. He immediately entered upon engineering work with the Washington Water Power Company, but in 1903 pursued his engineering studies and served for one year as an instructor in electrical engineering at the University of Wisconsin.

John H. Turner, district superintendent for the United Railways, St. Louis, Mo., for many years, died recently. He was the first man to take out a car during the strike of 1900 and the premier "gripman" of the days when cable cars were the vogue in St. Louis. He entered railway work in Chicago as a cable car operator. When St. Louis discarded horse cars in 1887 for the cable system he went to St. Louis as an instructor in cable car operation.

August Kruesi, former engineer of construction of the General Electric Company, died at El Paso, Tex., on May 7. Mr. Kruesi was with the British Thomson-Houston Company in London from 1898 until 1900. During the next two years he worked on electrical machine design for the General Electric Company at Schenectady. From 1902 to 1906 he was engaged in the commercial development of the Curtis steam turbine, and from then until 1908 was in the railway engineering department, working on power house and substation design. Mr. Kruesi was made head of the construction engineering department when it was established in 1908.

John Kerr, a pioneer in tramway construction in Great Britain, died recently. Mr. Kerr was for a long time managing director of Dick, Kerr & Company, Ltd. When cable traction was successfully developed in the United States a company called the Patent Cable Corporation was formed in England to exploit the system there, and in this Mr. Kerr was much interested. Several cable tramways were installed in Britain, notably the one in Edinburgh, and as a rule Dick, Kerr & Company were the contractors for the construction. As a separate company it also worked the Edinburgh cable tramways (now electrified). Mr. Kerr was also associated in the work of constructing various electric tramways, and his company went into the manufacture at Preston of electric traction machinery. Of late years Mr. Kerr was retired and the name of his company disappeared on its being amalgamated with other electrical manufacturing companies under the name of the English Electric Company, Ltd. He was 73 years old.

W. H. Bickle, chief motor inspector of the Louisville Railway, Louisville, Ky., died April 22. He suffered a stroke of apoplexy on Sept. 11 last and has been failing ever since. Mr. Bickle was born in Plymouth, England, on August 5, 1864. He came to America in 1880 and shortly afterward went to Louisville and was given a job with the old Central Passenger Railway, building crossings in the way department. Later he helped to install the motors on the first electrically operated cars in Louisville.

Hollis B. Rogers, builder and operator of one of the first electric railways in the country, died at his home in Brockton recently. Mr. Rogers started a line 1½ miles long in Brockton, Mass., known as the Brockton Street Railway. Other lines were extended to Whitman and thence to Randolph. Finally these lines, growing with the years, became part of the present Eastern Massachusetts Street Railway. Mr. Rogers was born in Wrentham, Mass., on June 14, 1841. He went to Brockton when a young man and started a stage line shortly after settling there. He was president of the Brockton Street Railway and after the consolidation vice-president and general manager of the Old Colony line. During the Civil War he was a lieutenant in the 20th Rhode Island Cavalry. He was a member of the New England Street Railway Club.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Many Bus Builders Bid on Kansas City Order

An avalanche of bus bids, with detailed specifications, has showered upon the receivers of the Kansas City Railways, Kansas City, Mo., as a result of the recent decision to buy 61 vehicles. As a consequence the receivers are busily engaged in making their final examination of the bids. Although the receivers are said to have tentatively decided the make of bus to be used previous to the opening of the bids, they recently asked for formal bids.

The bids were opened on May 9, but the matter of final choice is still under consideration. According to rumors, the delayed decision is due to the fact that the receivers wish to consider the various propositions in company with Judge Kimbrough Stone to assure there be no further delay in awarding the order.

The buses on which bids were asked include 40 single-deck, sixteen double-deck vehicles and five parlor cars.

One of the company's carhouses which has been leased for some time for use as a garage will be used to house the initial bus equipment until a permanent garage can be arranged.

Great Northern Awards Locomotive Order

Tangible evidence is afforded that the recent rumors were correct that additional electrification of the Great Northern Railroad was in prospect. The railway has now closed a contract with the Westinghouse Electric & Manufacturing Company for four electric locomotives and other equipment, to be used for the railroad's Cascade Mountain grade electrification. This stretch will extend from Skykomish at sea level through the Cascade tunnel to the summit. The electrification will cost $1,000,000. It will be undertaken immediately and is planned for completion within twelve months.

According to F. H. Shepard, director of heavy traction of the Westinghouse company, the electric locomotives will be an innovation in transportation. They will utilize direct-current motors operated from a single-phase, high-voltage alternating-current trolley. In this respect they will follow the principle announced by Henry Ford for the electric locomotive now building for his railroad.

Financial considerations have of course prevented the immediate electrification of many miles of railroads, but, as Mr. Shepard sees it, this situation is constantly improving owing to the more intelligent appreciation of our transportation problem on the part of the public and the decrease in tendency to hamper railroad progress by means of witless restrictive legislation.

As for the electrification itself, it calls for the extension of the present line through the Cascade tunnel and snowshed to a point west of the tunnel. The Great Northern is now operating three electric locomotives from a point east of the tunnel to a point part way through.

Electric Locomotives for Virginian Railway Demonstrated

Demonstrations were given on the afternoon of May 14 on the special test track at Pitcairn, Pa., of the first of the new single-phase electric locomotives built by Westinghouse for the Virginian Railway. Three 200-ton units, comprising one complete locomotive, were operated at normal speeds of 14 and 28 miles. Regeneration was demonstrated by having the electric locomotive pushed by a powerful Pennsylvania freight locomotive. For this purpose only one cab of three was in the circuit, but the steam locomotive was heavily taxed to move the electric. Other similar units in process of manufacture at the Westinghouse plant were inspected in the shops before the demonstration was staged.

The locomotive is the first completed of twelve ordered by the Virginian Railway for its $15,000,000 electrification project between Mullens, W. Va., and Roanoke, Va., described previously in the ELECTRIC RAILWAY JOURNAL.

Impregnated Paper Cables of American Manufacture

The Okonite Company, New York City, announces the formation of the Okonite-Callender Cable Company, Inc., to offer to the electrical industry in the United States impregnated paper cables made by the secret processes and under the patents of Callender's Cable & Construction Company, Ltd., London, England.

The installation of machinery under the supervision of Callender's engineers in the new plant at Paterson, N. J., is nearing completion and it will be ready for production July 1. This plant will combine the latest and best practices of this country and Europe. In it specially designed Callender machinery will be installed. It will also contain a completely equipped electrical research laboratory, which will work in conjunction with Callender's research laboratory. As the company sees it this will enable it to render an increasingly important service to customers in assisting them to solve their wire and cable problems.

In this connection it is of interest to note that Sir Thomas Octavius Callender, known through the electrical industry in Great Britain as "Sir Tom," will soon visit the United States for a short time. He has traveled widely in Europe, North Africa, India and the East. Sir Tom has been associated with the British electrical industry from its very commencement and, especially in regard to high-tension distribution, has been one of the pioneers and leaders. In 1873 he entered his father's office in London, the business then being in connection with the asphalt paving of streets. Experiments carried out by himself and his brothers led to the

ELECTRIC RAILWAY MATERIAL PRICES—MAY 12, 1925

Metals—New York

Copper, electrolytic, cents per lb.	13.60
Lead, cents per lb.	7.80
Nickel, cents per lb.	31.00
Zinc, cents per lb.	7.32
Tin, Straits, cents per lb.	54.50
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.25
Somerset mine run, Boston	2.075
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.875
Kansas screenings, Kansas City	2.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.375
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.50

Hardware—Pittsburgh

Wire nails, base per keg	2.75
Sheet iron (28 gage), cents per lb.	3.20
Sheet iron, galvanized (28 gage), cents per lb.	4.30
Galvanized barbed wire, cents per lb.	3.45
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.09
White lead (100 lb. keg), cents per lb.	0.1575
Turpentine (bbl. lots), per gal.	1.10
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	15.875
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	17.75

Paving Materials

Paving stone, granite, 4x8x4, f.o.b.	
Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.86
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.125
Light copper, cents per lb.	9.375
Heavy brass, cents per lb.	6.50
Zinc, old scrap, cents per lb.	4.125
Lead, cents per lb. (heavy)	6.875
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	16.25
Rails (short), Chicago, gross ton	17.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	8.75

discovery of the insulating product known as vulcanized bitumen. This product was patented in 1881.

In 1882 a company was formed to manufacture insulated wires and cables and generally develop vulcanized bitumen as an insulator, and during the next few years a large proportion of the early underground mains in London and the provinces were manufactured and laid down by the Callender company. The development of the electrical industry, with the consequent increase in the demand for underground mains, rendered it necessary to reorganize the original business, and in 1898 the present company, Callender's Cable & Construction Company, Ltd., was formed to take over the old Callender company.

Sir Tom is now and has been for many years past the managing director of Callender's Cable & Construction Company, Ltd., and is on the board of a number of subsidiary companies formed by that company. In addition, he is a director of several of the great power companies of Great Britain.

Government's Foreign Trade Policy Defined

Charles Evans Hughes declared before 700 members of the Chamber of Commerce of the State of New York on April 28 that the fundamental policies of the government make for peace, and that friendly trade and commerce with all the world have been made possible by governmental co-operation with business in foreign relations.

Taking up a remark once made by Mr. Choate that commerce in the future would be the real pacifier, Mr. Hughes said he had "a preference for two-named paper," and declared that "commercial promises of peace go better with the indorsement of sound governmental policies." The speaker then mentioned the struggle for raw materials, for places in the sun, and said that "unless this economic urge is controlled by reasonable men the securities of peace for which we look in the activities of commerce are not worth as much as often they are thought to be." Among other things Mr. Hughes said:

> I am glad to think that the more fundamental policies of our own government make for peace—not because we are a nation of pacifists, that is an illusion, because our form of organization, our method of political action, our national disposition, favors the processes of reason. I know there are some who think that our government does not espouse with sufficient ardor the cause of business expansion abroad, that it is a mistake to withhold desired assurances of support when American interests seek opportunities in other lands, and other governments are held up to us as patterns of the sort of governmental enterprise and backing which would assure success in a world competition. I think that this is a short-sighted view.
>
> It should be enough to point out that under our system it would be a mistake for the executive branch of the government to offer assurances which it could not make good; to give to other countries an impression of interference, none the better because more pretended than real; to develop among other peoples the suspicion and lack of confidence which such a policy inevitably produces.
>
> Our policy rests on the conviction that given an equal opportunity abroad, fair and equal dealing, American business men can take care of themselves. It is because of this policy that American capital is welcomed in many countries needing development. Our government does not play favorites among American business men, and it seeks for all, and I think I may say with increasing success, the open door of opportunity. I believe that the government has the strong support of business organizations in maintaining this intelligent restraint. It is a restraint not as generally recognized as it should be.

Rolling Stock

Fort Dodge, Des Moines & Southern Railroad, Boone, Ia., through its subsidiary, the Fort Dodge Line Transportation Company, ordered three passenger coaches seating 21 for operation between Iowa State College and Ames. Delivery is expected by June 1.

Indianapolis Street Railway, Indianapolis, Ind., has placed tentative orders for twenty new buses in the event that the commission will grant the company's new bus petition. The new investment, referred to elsewhere in this issue, amounts to about $250,000.

Marion & Bluffton Traction Company, Bluffton, Ind., through its officials recently made a trial trip of one of the new one-man type of interurban cars recently purchased. The new car is about 45 ft. long. The Public Service Commission has authorized the company to issue $32,000 of 7 per cent equipment notes to finance purchase of two new interurban cars.

Track and Line

Kansas City Railways, Kansas City, Mo., has been authorized by Judge Kimbrough Stone to build new tracks on Thirty-first Street, Benton Boulevard to Indiana Avenue and on Brooklyn Avenue from Eighteenth Street to the north end of the Kansas City Terminal Viaduct.

Grand Rapids Railway, Grand Rapids, Mich., has started work on reconstruction of its tracks and repaving in Wealthy Street from Division Avenue to Eureka Avenue. This will represent an approximate expense of $122,840. More than a mile, or to be exact, 5,700 ft., of new double track and paving will be laid by the company.

San Francisco, Cal.—The Bureau of Engineering of the San Francisco Department of Public Works is making surveys for the proposed extension of the Municipal Railway into the Excelsior district. The unit will be an extension of the Potrero Avenue line.

Portland Electric Company, Portland, Ore., plans the expenditure of $3,000,000 in 1925 for improvements, extensions and betterments. Of this a little more than $1,000,000 will be used for the railway department in both city and interurban improvements.

Power Houses, Shops and Buildings

Boston Elevated Railway, Boston, Mass., is having plans prepared for a garage at Malden.

Salt Lake & Utah Railroad, Salt Lake City, Utah, suffered the loss by fire of its automatic electric substation at Curtis, Utah, a station 3 miles north of Provo, on April 28. The loss is estimated at about $50,000.

Trade Notes

Archer & Baldwin, Inc., New York, N. Y., well-known dealers in used steam and electrical power equipment, are moving their offices from 114 Liberty Street, New York City, to Bound Brook, N. J., where they have for a number of years had a warehouse. This change is made to facilitate shipments, to permit constant supervision of rebuilding operations and, through direct contact with stock, to make immediate reply to all inquiries.

Roller-Smith Company, 233 Broadway, New York, N. Y., announces the appointment of the Detweiler-Bell Company, 101 Milk Street, Boston, Mass., and 152 Temple Street, New Haven, Conn., as its representative in the New England States. The personnel of the Detweiler-Bell Company consists of Paul G. Detweiler, in charge of the New Haven office, and R. H. McCormick, in charge of the Boston office. The Detweiler-Bell Company succeeds Walter W. Gaskill, who has been representing the Roller-Smith Company in the New England territory for several years in the sale of electrical measuring instruments and circuit breakers.

The White Company, Cleveland, Ohio, announces the removal of the Eastern region office of Martin A. O'Mara, vice-president, and also the New York office of the export department from 61 Broadway to Room 2630, Whitehall Building, 17 Battery Place.

New Advertising Literature

Chase Companies, Inc., Waterbury, Conn., not long ago entertained a guest, F. G. Cooper, whose frankly frivolous cartoons have been a feature of *Life* for longer than he himself might care to admit. The results of Mr. Cooper's visit have been appearing in some of the trade journals and have attracted so much friendly interest and amusement that the Chase Companies decided to publish them in permanent form.

Fageol Motors Company, Oakland, Cal., has issued its revised instruction book with suggestions for keeping coaches "in top earning condition as many days in the year as possible." The book contains 75 pages and an index.

American Manganese Steel Company, Chicago Heights, Ill., is sending to its prospective customers a circular which contains a list of practically all of the applications of manganese steel so far developed and a tabloid exposition of the character and peculiarities of manganese steel. The company is also distributing a copy of the little magazine, published monthly by the Machinery Club of Chicago, called *Chatter*, on page 8 of which is an article describing operations at Chicago Heights in the manufacture of Amsco manganese steel castings. The company is now producing manganese steel in six plants by the electric furnace process. The company is a member of a group of industries controlled by the American Brake Shoe & Foundry Company.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 23, 1925 *Number* 21

Modernization of Railway System Wins Public Approval in Pittsburgh

IN SHARP contrast to the oft-repeated philosophy that "it's never been done before, and it can't be done now," is the attitude of the management of the Pittsburgh Railways. Satisfaction with things as they have always been, that insurmountable barrier to progress, is conspicuous by its absence. The present feeling is exactly the opposite. Methods that have been in effect for a long time are critically examined to see if changing conditions have not rendered them obsolete. Any plan which gives reasonable promise of improving the service is tried, no matter how greatly it differs from established practice.

As a result of this attitude on the part of the management, many changes have been made during the past year. A description of the more important improvements made since the reorganization of the company is given elsewhere in this issue. It is not expected that all of the changes will turn out to be 100 per cent successful, but it is already evident that many of them are accomplishing remarkable results.

Of greatest importance, perhaps, is the realization by the public that the railway is a going concern, that it is doing things all the time, that day by day it is improving the quality of its transportation service. There is no danger that people in Pittsburgh will consider the street railway a "back number." On the contrary, they must step lively to keep up with the progress of the company.

Public opinion has swung over to the railway. There is general realization that the welfare of the community and the prosperity of its transportation system are bound closely together. The city does its part by liberal treatment of the company, and in return the railway spares no effort to give the best possible service.

Protection of Highway Crossings Is Becoming More Important

CONSTANTLY increasing numbers of automobiles using the public highways make more important than ever before the matter of protecting interurban grade crossings. Time was when a white cross on top of a supporting post was considered sufficient warning to the highway user that he was approaching a railroad crossing. That idea has now been superseded by the belief that it is good business for electric railways to do everything in their power to protect highway crossings and prevent accidents.

A few over-cautious railway men have hesitated to install modern warning signals for fear that in case of signal failure the company might be held more culpable for having installed a device that failed to work than if no protection at all had been provided According to this theory, a single failure might outweigh all the good accomplished by giving warning of danger many thousands of times. In the eyes of certain other railway managements crossing signals are of little value because some motorists flagrantly violate their indications. Here again the occasional failure is deemed of greater importance than the habitual, satisfactory performance.

In reality, however, most highway crossing signals function satisfactorily with extremely infrequent failures. Moreover, a large majority of the drivers of vehicles heed these warnings. This is clearly understood by most of the progressive interurban managements, and important expenditures are being made constantly for this kind of accident prevention. That these companies are spending money in this way is a good indication that crossing protection is well worth while.

Progress Now Being Made in Electrification of Railroads

RAILROAD electrification is once more making headway in the United States. This is evidenced by a number of recent events that are significant. One is the decision of the Great Northern Railway to electrify its line across the Cascade Mountains. Another is the successful test of the first electric locomotive for the Virginian Railway, which took place last week. Both of these developments are in line with the decision made some time ago by the leading electrical manufacturers to standardize the type of contact line.

In view of these developments the addresses made at the annual meeting of the American Institute of Electrical Engineers, and reported in this issue, were of special significance. Now that the engineers have decided on a standard for electrification work, the railroad financiers and executives can plan ahead with confidence. They know that other engineers will not come along and upset all the plans by arguing for a different system.

There can be little argument but that the system agreed on—a single-phase contact line at high voltage—is a very happy solution of the problem. With its use it has been found possible to employ motors of any desired type, either directly or through suitable conversion apparatus. Thus extreme flexibility of operation is possible on a system which can be adopted as a standard for all future projects, and the equipment will be entirely interchangeable.

Another type of electrification is that of the Long Island Railroad. Inauguration of electric service between Jamaica and Babylon this week was the occasion for rejoicing on the part of the residents. It is noteworthy that real estate promoters have not been slow to bring the advantages of the new service before the public. Undoubtedly they will make much more profit out of the change than will the railway. Nothing could show more conclusively the value of fast and frequent service in building up a community.

Selling Brooklyn Service to Smokers

NEWSPAPER reading New Yorkers—and that means about everybody—were startled recently by being told that Transit Commissioner Harkness had said he knew of no law against women smoking on the street cars. This remark was only incidental to the main one of his passing favorably on the application of the Brooklyn City Railroad to permit smoking during the summer months in the rear section of the company's new pay-as-you-pass cars, an additional lot of which are now going into service. Of course, the idea of seeing "lovely woman stoop to folly" appealed to the headline writers and to the paragraphers. It was natural that it should. The news reel people also were quick to grasp the significance of the rule as feature stuff. They shot pictures with the co-operation of the railroad and in this way helped to advertise the new cars by showing on the screen passengers of both sexes indulging in the weed.

Conditions have changed considerably since the non-smoking rules were adopted by the former Public Service Commission. Indeed they have. The commissioner went to some length to point this out. Smoking is an old custom, but it has taken on new frills, not the least of which is the Dawes pipe. Still Mr. Harkness did a brave thing in saying that he would be glad to hear from the public, either for or against the measure, so that he might carefully weigh the matter "as a preliminary to any further action." Despite this, no storm of public protest has followed the announcement. The persistent *Pro bono publico*, if he has thought about it at all, has been discreetly silent. Not even Mayor Hylan has protested, but he may have Mr. Hirshfield gumshoeing around to learn whether Mr. Harkness is interested in Schulte or the United Cigar Stores.

One of the lines on which the new cars will run is the Flatbush Avenue route. On it at present there are many open cross-bench cars. Smoking is permitted on the rear seats of these cars. The Flatbush run has a large proportion of short-haul riders. The railroad did not want to lose any of its customers. There is no likelihood that it will now. In fact, the prospects are that the patronage of men will increase on other lines where this type of car has been in use for some time. This is all the company is seeking to achieve. The Brooklyn case is a peculiar one. This is instanced by the fact that the commission did not issue a blanket order. In fact, it made it quite plain that it was out of the question to expect a general extension of the smoking privilege.

Sustained Effort Is Necessary to Achieve Results in Safety Work

SPASMODIC public safety campaigns, more or less evangelistic in their nature, are of little benefit unless they are followed up by sustained effort. Such has been the experience in a number of cities where they have been tried. Unfortunately the spectacular campaigns have not always aroused sufficient general interest to insure the continuation of safety work.

Equally good or better results are more likely to be accomplished by quiet, continuous efforts along safety lines, than by occasional drives, mass meetings, etc. Moreover, certain methods followed by a few of the organizers of the evangelistic type of safety campaign perhaps have antagonized a portion of the public. Gruesome exhibits, grotesque monuments of those killed in accidents, the unfortunate slogan "safety first," these and similar well-meant but ill-advised schemes in some cases may have hampered the progress of the work by alienating public sympathy.

Benefits resulting from systematic safety efforts are so genuine and important that no more forceful argument could be found than the clear presentation of these facts. Steady hammering will eventually drive home the lesson. Electric railways and other utilities have played an important part in this work. But they cannot do it all themselves. Their efforts must be supported by equally systematic endeavors on the part of the public as a whole.

High Buildings— A Menace to City Development

MUCH has been learned within the last few years in regard to means for relieving street congestion, as well as its causes. If it had not been for the automobile, our knowledge of these subjects would not have progressed so rapidly. But the large number of vehicles now using the streets has compelled recognition of a serious situation, which with horse-drawn vehicles might have been longer in coming. But it is certain that it would have come in most large cities even without the automobile.

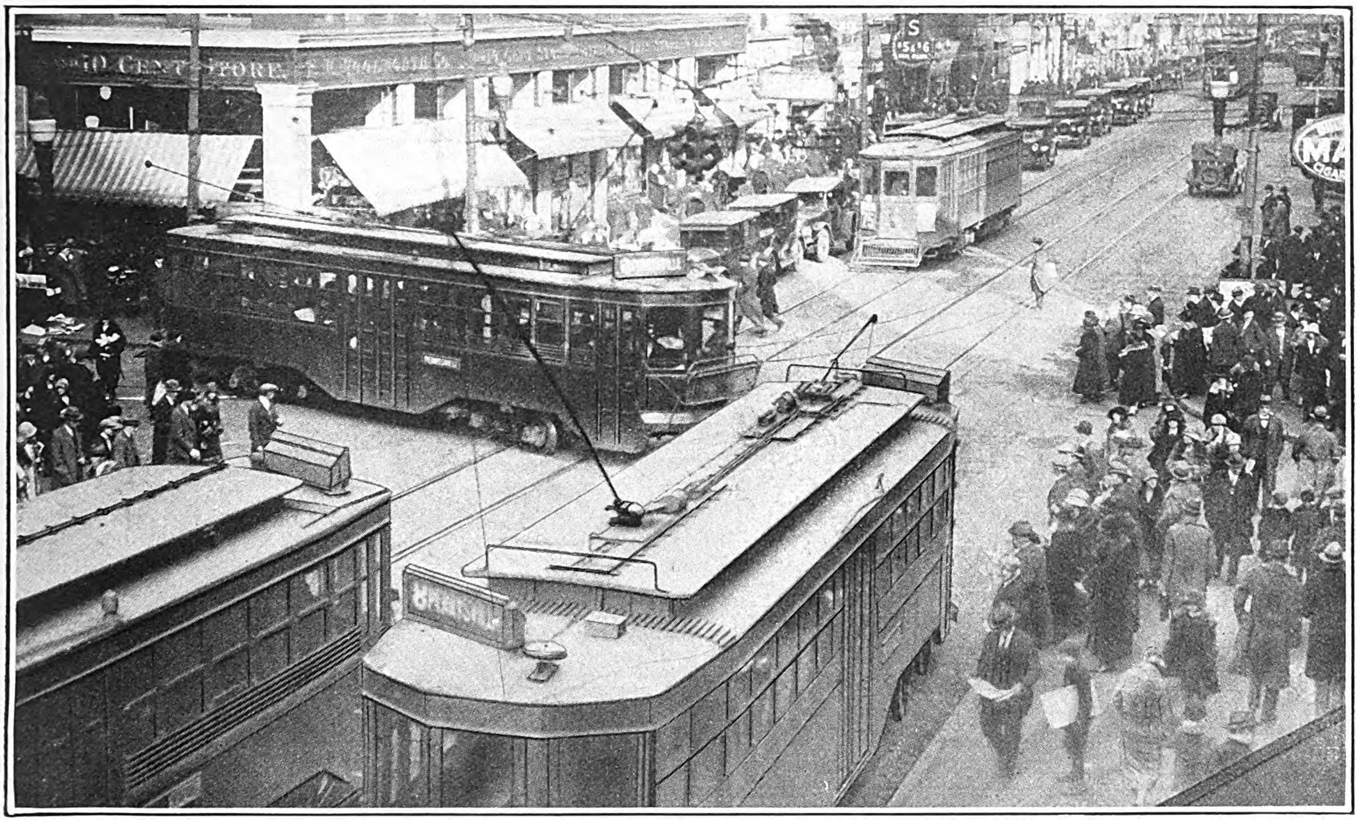
Recent conferences on city planning have developed some very definite lines of procedure which must be followed if city dwellers are to continue to live comfortably and conduct their business with economy. These principles are wide in scope and include far more than non-parking ordinances. Parking restrictions and other means for securing more efficient use of the streets are like certain medicines listed in the pharmacopœia for reducing fever. They are necessary for immediate relief, but do not entirely remove the cause of the disease. It is the same with street congestion. If unhealthy conditions are allowed to continue, palliatives like parking restrictions are inadequate to occasion a complete cure, according to Harland Bartholomew, speaking before the United States Chamber of Commerce this week.

The real cause for congested streets, of course, is the effort made to obtain from them far more use than that for which they were originally designed, and as in most cases they cannot be widened at a reasonable expense, the only practical remedy is to divert as much traffic as possible to streets which are less congested. Fundamentally, this means decentralization—a spreading out of the city—with many business and civic nuclei or centers, rather than a few. It also means a limitation on the height of buildings or on the average height of buildings within an area so that the demand for transportation by the occupants of these buildings will not exceed the transportation capacity of the streets serving that district. Viewed in this light, the tall building becomes a menace rather than an object of business pride, and the famed "skyline" of some of our cities, like New York, becomes a symptom of civic sickness rather than business health.

The only condition which makes transit possible in the downtown areas of most of our large cities is that all of the ground area there is not developed with tall buildings. If this was so, business would be impracticable. Modern practice in city planning therefore favors decentralization of business and business activity. Fortunately this is a condition also which would simplify the local transportation problems.

Rehabilitation of Pittsburgh Railways Brings Many Improvements

Since the Reorganization in 1924 the Financial Position of the Company Has Been Strengthened and Much New Equipment Purchased—Public Relations Have Been Improved and Relief from Paving Obligations Has Been Obtained—An Abstract of the Agreement with the City Is Given



Low-Floor Cars with Center and Front Doors Are Now the Standard for City Service on the Pittsburgh Railways

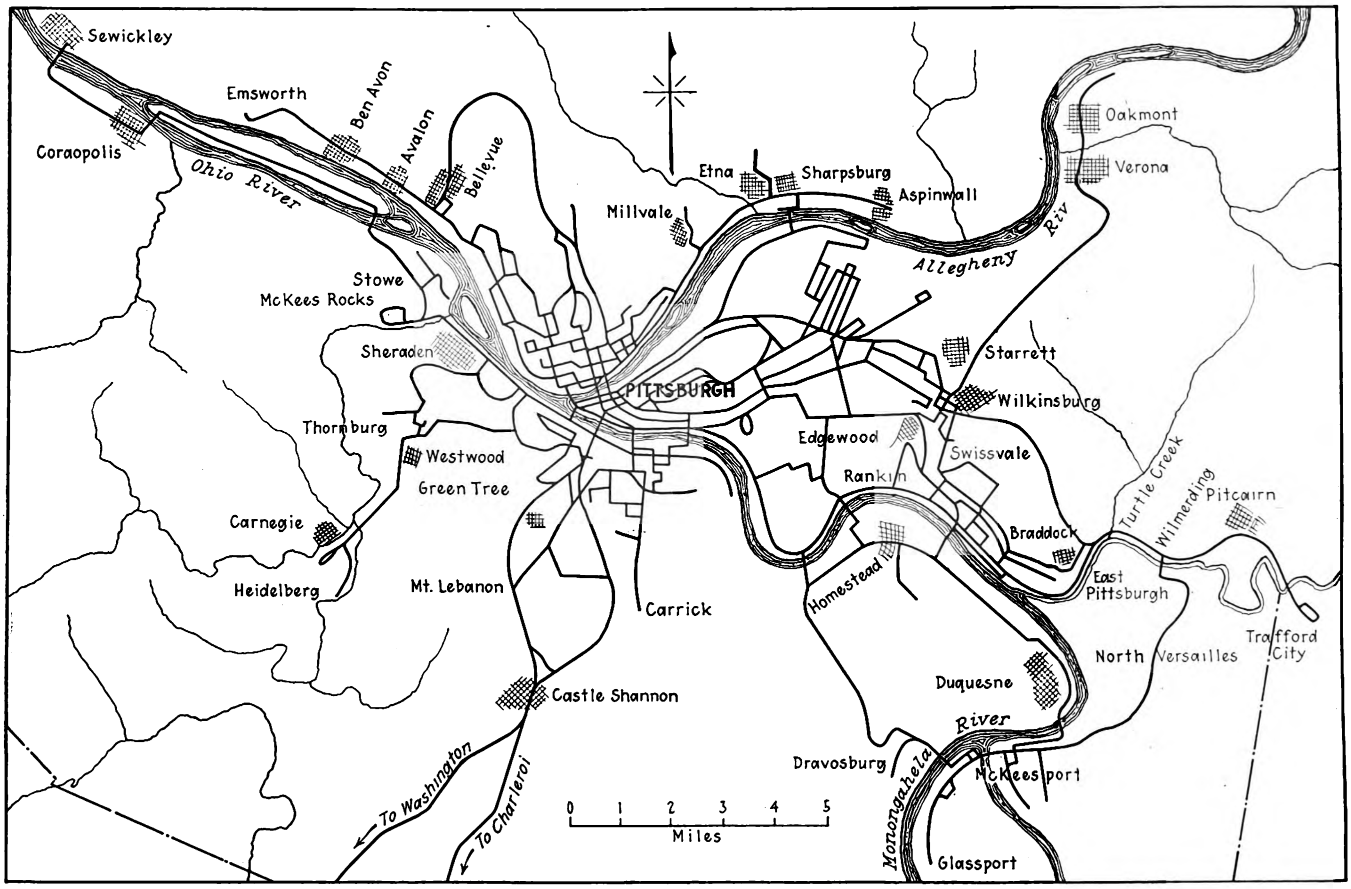
NOTABLE progress has been made in the rehabilitation of the Pittsburgh Railways since the reorganization, slightly more than a year ago. A total of 328 new passenger cars have been ordered, of which about 200 have already been delivered and placed in service. When the work for this year is completed approximately 40 miles of track will have been rebuilt. In addition a considerable amount of new track already has been constructed. Extensive improvements are being made in the shop facilities. In every way the quality of transportation service rendered is much higher than for many years past. This has resulted in improved public relations.

Adoption of a comprehensive agreement with the city is the foundation upon which the rehabilitation has been based. For more than ten years prior to the reorganization of the company there had been a long series of controversies between it and the various municipalities served. Three-quarters of a million dollars was expended in making investigations, reports and valuations. Six general surveys were made of the transportation situation by outside engineers and nineteen separate reports filed.

A crisis was reached in the early part of 1918 and the company was placed in the hands of receivers appointed by the United States court. The receivership lasted for approximately six years. It was generally recognized during this period that in order to provide good transportation service the railway required new cars, additional carhouses, new shop equipment and the renewal of many miles of track. However, it appeared impossible to secure money for such purposes as long as the company remained in the hands of receivers. Many of the yearly payments due the city of Pittsburgh, covering street cleaning, bridge tolls, taxes on poles, wires and gross receipts, were not being made by the receivers. It was therefore the desire both of the city and of the company that the receivership be terminated and the property restored to its owners. This was finally done on Feb. 1, 1924, despite some doubt expressed by the court as to the actual solvency of the company. Before finally discharging the receivers the court arranged to continue a certain measure of protection for a period of ten months after the receivership ended.

Termination of the receivership was made possible by the adoption of a somewhat unusual agreement between the railway and the city. Outstanding features of this agreement are:

1. Recognition of the $62,500,000 valuation established by the Public Service Commission.
2. Fixing an annual rate of return of 6 per cent on this valuation.
3. Adjustment of fares to provide sufficient revenue to meet the allowed return on the investment after operating expenses, depreciation, taxes, etc., have been paid.


Sewickley
Emsworth
Ben Avon
Avalon
Bellevue
Coraopolis
Ohio River
Etna
Sharpsburg
Aspinwall
Oakmont
Verona
Millvale
Allegheny Riv
Stowe
McKees Rocks
Sheraden
Starrett
Wilkinsburg
PITTSBURGH
Thornburg
Westwood
Green Tree
Edgewood
Swissvale
Rankin
Turtle Creek
Wilmerding
Pitcairn
Carnegie
Braddock
Heidelberg
Mt. Lebanon
Carrick
Homestead
East Pittsburgh
Trafford City
North Versailles
Castle Shannon
Duquesne
River
Dravosburg
McKeesport
To Washington
To Charleroi
0 1 2 3 4 5
Miles
Monongahela
Glassport

Although Divided Into Many Separate Municipalities the Territory Served by the Pittsburgh Railways Is Practically One Continuous City

4. A blanket payment of $300,000 a year in lieu of previous license fees, paving charges, tolls, taxes, etc., payment to be made only when earned.
5. Establishment of a Traction Conference Board of four members representing the city, the boroughs and the railway.

This agreement also paves the way for some future readjustment of the capital structure to result eventually in one united ownership of all the underlying properties, of which there are more than one hundred. A liability of approximately $8,200,000 was assumed by the company in place of outstanding floating obligations of about $11,000,000, and the various creditors agreed to take one-tenth of their claims per year over a period of ten years without interest.

Establishment of the $62,500,000 valuation of the property fixed by the Public Service Commission was a compromise between the city, which hoped to see the value set at $48,000,000, and the company, which was asking for $78,000,000. Acceptance of a 6 per cent return was in the nature of a concession by the railway because previous decisions in Pennsylvania had established that public utilities are entitled to a return of 7 per cent. After the adoption of the agreement and its approval by the Public Service Commission the valuation cases which were pending in the Superior Court were discontinued.

Acceptance of an annual payment of $100,000 instead of a miscellaneous assortment of fees, tolls, taxes, etc., represented a substantial concession on the part of the city. Even more important was the elimination of paving charges. According to law the railway is required to pave between the tracks and 1 ft. outside each outer rail. Under the new agreement, however, the city does all the necessary work of paving and repaving which is not necessitated as a result of track removal, replacement or maintenance. For all such work the company pays $200,000 annually in quarterly installments. It is arranged that in case the track mileage within the city is increased or decreased proportionate changes shall be made in the amount of both payments, which now total $300,000.

Should it happen that for three consecutive months of any year the revenue of the company is not sufficient to pay the allowed return to capital and to meet the budget requirements, and if it appears that this deficit is likely to continue for a further period of at least three months, the city agrees to the suspension of the quarterly payment for licenses, etc., and for paving, or as much of such payment as may be necessary to make up the deficit. In case the deficit still exists at the end of the year, all such suspended payments are canceled.

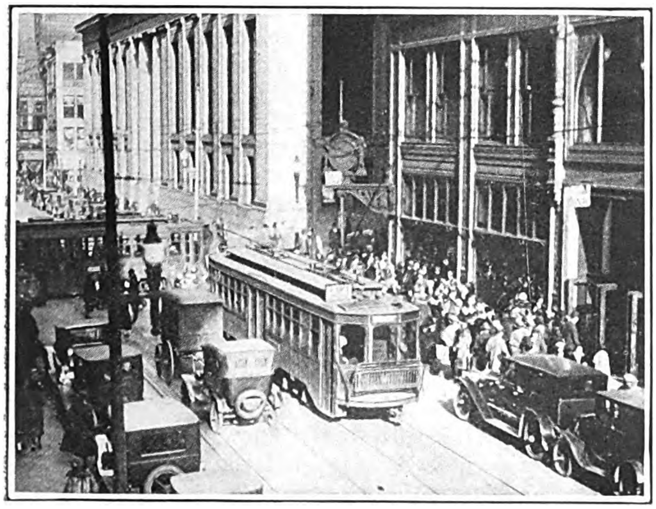
Adjustment of these matters is in the hands of a Traction Conference Board. Creation of this board was one of the important parts of the agreement. It is composed of four members, two appointed by the Mayor of Pittsburgh, one by the joint action of the municipalities other than the city of Pittsburgh signing identical agreements and one selected by the company. All matters coming before this board are decided by a majority vote. In case of a tie, however, the vote of the representative of the company does not count. Each member of the board holds office during the pleasure of the authority responsible for his appointment.

Through the Traction Conference Board the city and the boroughs now have a voice in the amount of money which the railway spends for operation, extensions, betterments, improvements, depreciation allowance and rehabilitation. Thirty days before the end of the fiscal year the company submits a detailed budget for the ensuing year. This is subject to revision by the board. Throughout the year monthly reports are submitted for comparison with the budget figures. At any time the railway may submit a supplementary budget, which is treated in the same way as the original. The expenses of the board, limited to $50,000 a year, are borne by the railway.

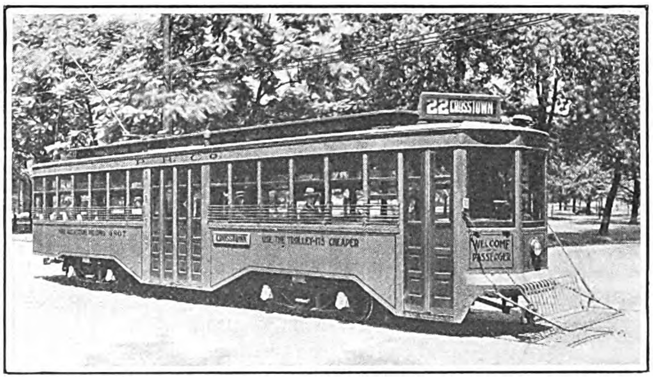
In case either the city or the company is dissatisfied with any action of the Traction Conference Board the question in dispute is submitted to a board of arbitration, composed of three members, one appointed by the Mayor, one chosen by the company and the third chosen by these two. The decision of the arbitration board is final except on matters over which the state Public Service Commission has jurisdiction. In such cases either party has a right of complaint to that body.

FARE ADJUSTED ACCORDING TO EXPENSES

At the end of any fiscal year, if there is a surplus in the earnings of the railway over and above the operating expenses and the return to capital, the company turns over the whole of this surplus to the Traction Conference Board. The latter body distributes it to the city of Pittsburgh and other municipalities joining in the plan in proportion to the number of miles of track in each municipality. If, however, the surplus is created by reason of economies in operation, then the company is entitled to retain one-half of such saving for its own use, with the proviso that the average car fare during the greater portion of the year must have been less than that in effect at the time of the agreement.



Narrow Streets and Heavy Traffic Are Serious Transportation Problems in Pittsburgh



The New Spirit of Transportation Service Is Typified by This Car

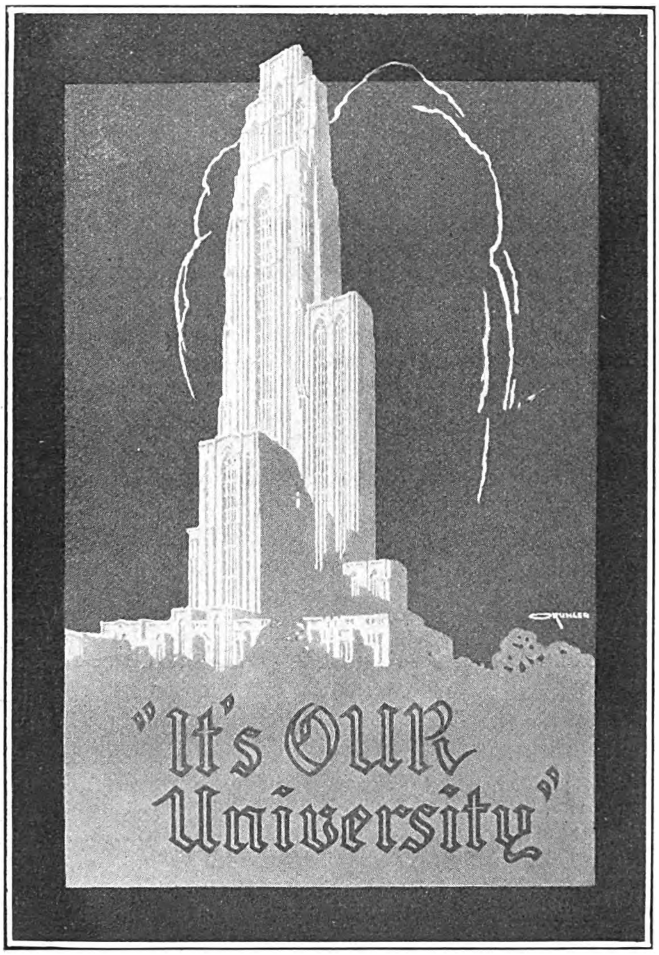
In case the surplus at the end of any quarter is of such amount that in the opinion of the Traction Conference Board a reduction in car fare would be justified, then the city or any of the municipalities or the board itself has the right to apply to the Public Service Commission for a reduction. Against this the company agrees to make no objection. On the other hand, if it is necessary at any time to increase the fare in order to meet the approved budget requirements and the accrued accumulative return to capital, the company has the right to file with the Public Service Commission schedules for an increase sufficient to enable it to carry out the requirements, in which case the cities and municipalities agree to make no objection.

Approval by the cities of Pittsburgh, Washington, Pa., and a number of other smaller municipalities has been secured for this new agreement. To a large extent this was made possible because during the preceding several years A. W. Thompson, president of the Philadelphia Company, had gained the confidence of the people of Pittsburgh. He had become the head of that company during the railway receivership and had done much to improve the public relations of the Duquesne Light Company and the Equitable Gas Company, subsidiaries of the Philadelphia Company. For that reason the public was more than willing to have the Pittsburgh Railways taken out of the hands of receivers and restored to operation under the management of the company of which he was the president.

As a condition precedent to the return of the property to private management arrangements were made for $5,000,000 of new financing. As stipulated in the agreement, this was borrowed in the Pittsburgh district. Another step taken to insure local control of the railway was the arrangement that after the reorganization two-thirds of the directors should always be chosen from Pittsburgh or the surrounding municipalities.

During the fifteen months since the ending of the receivership great emphasis has been placed on the matter of improving public relations. Extensive and skillful publicity campaigns have been conducted. Artistic posters, changed weekly, are carried in the cars. Interesting little pamphlets are placed periodically in the "Take-One" boxes. Friendly messages have been conveyed to the public in a variety of ways. The measure of success which has attended these efforts may be judged from the sympathetic attitude taken by the public toward the company at the time of the trainmen's strike last summer. Another indication is the recent passage of no-parking ordinances covering practically all downtown trolley streets. How this has improved operating conditions will be told in detail in a future article in this paper.

Behind the idea of improved public relations has been always the idea of giving better service. Immediately after the reorganization orders were placed for 225 new cars. Nearly all of these have been received and placed in service. A number of trail cars have been equipped with two motors each, which has materially increased the speed of these trains on the many hills in this district. This plan was described in ELECTRIC RAILWAY JOURNAL for June 2, 1923, page 919.



Artistic Posters on General Subjects Are Part of the Public Relations Work

In order better to attract attention to the new cars they are painted traction orange instead of red, the color previously used. Other cars of modern center-door low-floor type have been repainted to match. Older type cars, however, are still painted red and it is planned to retire them from service as soon as possible.

Recently 103 more cars of the same general low-floor design were ordered. Of this number 20 will be used on the interurban lines and the remaining 83 will be one-man, two-man multiple-unit city cars.

Approximately $500,000 is being spent on ten new administration buildings, to be located on property which the company owns in various parts of the district. It is planned to expand the development into modern carhouse structures at these locations. Recreational facilities will be provided in the administration buildings as well as first aid rooms and passenger rooms. The company stresses the point that these shall not be called "waiting rooms."

NEW MACHINERY FOR MANCHESTER SHOPS

Motor test set
Bearing boring machine
Set electric melting pots (babbitt)
Double-boring lathe for compressors
Bullard wheel-boring machine
2 Electric soldering pots
4 Oil-burning blacksmith furnaces
Large size Bulldozer riveter, 100-ton
Air hammer
Automatic electric wheel welding machine
2 Emery wheel stands
18-in. manufacturing lathe
Cleveland pinion puller
Portable band saw for wood or metal
Wheel-turning lathe, 35 and 5 hp. motors
Rotary saw, 5 hp.
Axle lathe, 25-hp. motor
Shop air compressor, 350 cu.ft.
5 Oil tanks with hand pump equipment
Motor and fan dust-collecting system
Motors

NEW MACHINERY FOR HOMEWOOD SHOPS

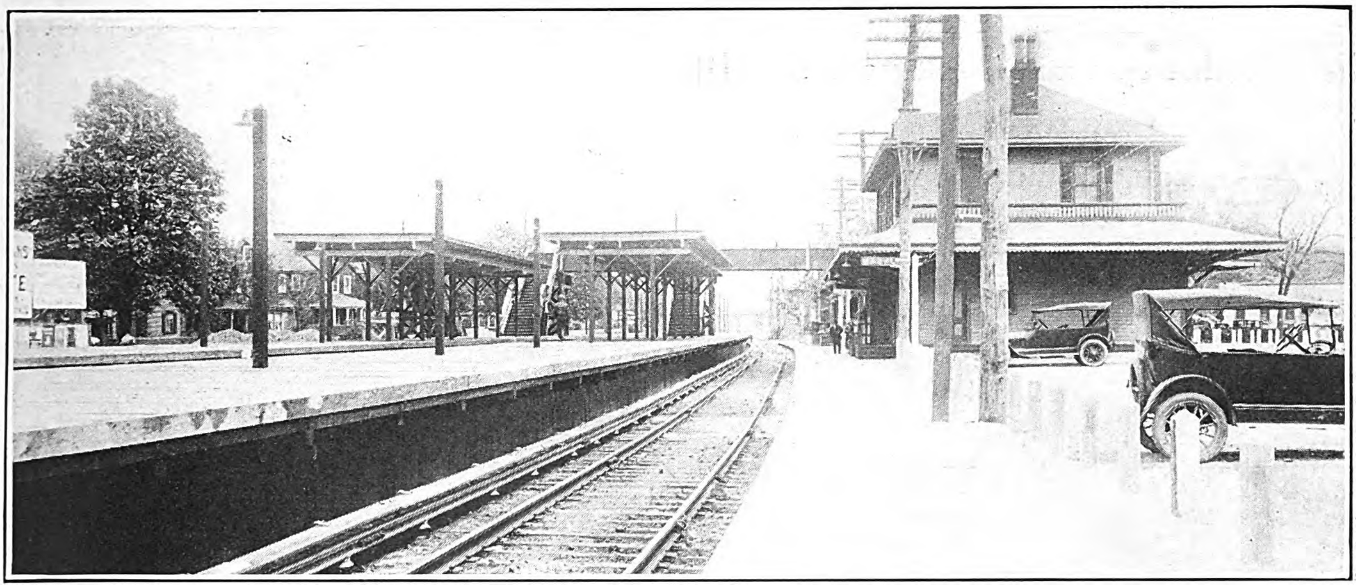
1 5-ft. radial drill
1 16-in. 8-ft. tool room lathe
1 27-in. heavy-duty manufacturing lathe
1 Boring machine for bearings
1 Hanna riveter, 100-ton
1 Metal shears for No. 8 gage x 96-in. sheet
1 Axle straightener
1 Automatic cut-off machine for bushings
1 Bullard boring mill
1 Bradley hammer
2 High-speed $\frac{9}{16}$-in. drill presses
2 Blacksmith oil furnaces
1 Hollow chisel mortiser
1 Wood-working shaper
1 Wood vertical boring machine
1 Portable wood or metal band saw

Track rebuilding for the current year will cost nearly a million dollars. At the same time extensions and connections will cost about $200,000 more. This will make possible a number of important changes in routing in the downtown district. An article concerning track reconstruction on the Pittsburgh Railways will be published in a future issue of this paper.

Acquisition of the Manchester plant of the American Locomotive Company has permitted the Pittsburgh Railways to establish a second important car shop alongside its Manchester carhouse. More than $50,000 is being spent to equip this shop. At the same time extensive changes are being made in the older Homewood shops of the company. Much new machinery has been ordered for that purpose. In this plant a change from belt drive to individual motor drive will be made, along with the other improvements. An outline of the new machinery is given in accompanying tables.

More than $300,000 is being spent for improvements to the overhead lines. More feeder capacity is being provided. Extensive signal installations have also been made.

From the standpoint of the public, one of the most important changes that have been made during the past year is in the matter of fare. In all 35 changes have been made. The base fare of 10 cents cash, three tokens for 25 cents, has remained unchanged. Special transfer privileges have been granted in many cases, however. The Sunday pass has proved a successful experiment. A 5-cent fare is being charged in several local areas. While the total volume of traffic affected by these fare changes is not a large part of that carried by the system, the many people who have benefited by them are greatly pleased, and this has been a helpful factor in improving public relations.



Two New High-Level Island Platforms Connected by Overhead Bridge and Stairways Were Constructed at Babylon Station

Service Started on Babylon Electrification of Long Island Railroad

Two-Track Line from Jamaica to Babylon, L. I., a Distance of 28 Miles, Electrified—Cost Approximately $5,000,000—Six New Substations Were Built, Transmission and Third-Rail Lines Installed and the Station at Babylon Was Reconstructed

FOURTEEN all-steel electric cars made up a jubilee train that started on May 20 from the Pennsylvania Station in New York to mark the official opening of the new Jamaica-Babylon electrification. As passengers the train carried officials of the railroad, invited guests and representatives of the various civic and commuters' associations along the line. It stopped at every station of the Montauk division and was noisily greeted at each of them.

The long red train, lacking the steam locomotive that had long been familiar, looked strangely decapitated to the residents as it drew into each station to take on the local dignitaries bound for the opening ceremonies at Babylon. Many floral pieces were presented as good-will offerings, and thousands of men and women were gathered about the flag-draped stations of every village and town along the route. It seemed almost as if no hand and no house along the way was without its flag. Children flung colored paper streamers in through the windows until the fourteen cars resembled a bridal procession. At Baldwin a squadron of airplanes met the train as an escort and dropped flowers and programs.

GROWTH OF COMMUTER TRAFFIC ON ELECTRIFIED DIVISION OF LONG ISLAND RAILROAD BETWEEN 1905 AND 1924

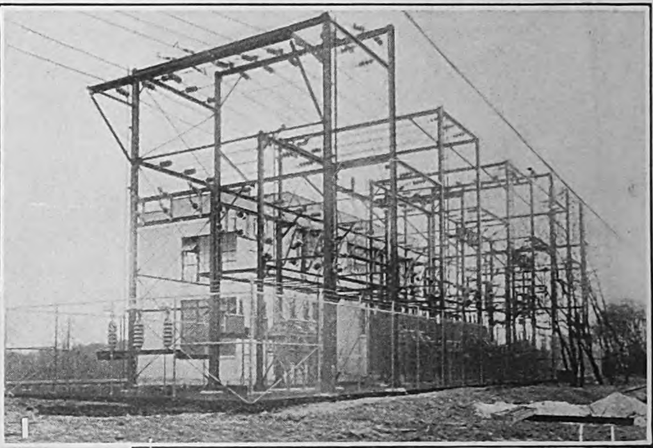
	Number of Commuters 1905	1924	Per Cent of Increase
Rosedale	200	5,601	2,700.5
Cedar Manor	186	4,839	2,501.6
Locust Avenue	43	2,259	5,153.5
Higbie Avenue	41	5,949	14,409.9
Laurelton	41	3,179	7,653.7
Valley Stream	623	13,386	2,048.6
Lynbrook	2,449	20,395	732.8
Jamaica	2,742	35,657	1,200.4
Hollis	1,059	20,046	1,792.9
Queens Village	733	30,740	4,093.7
Hempstead	2,486	15,277	514.5
Long Beach	100	21,397	21,297.0
Bayside	2,027	12,278	505.7
Port Washington	1,179	10,733	810.3
Far Rockaway	4,183	42,740	921.8

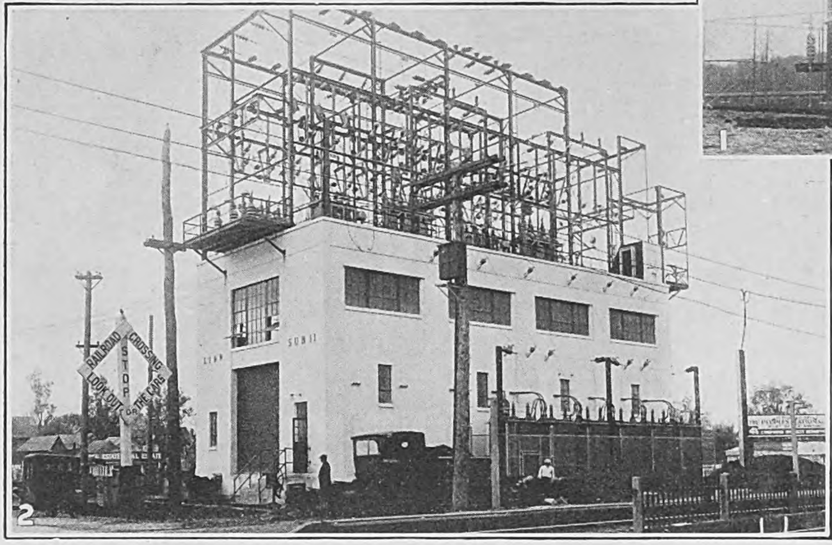
At Babylon sirens shrieked to the boom-boom of the aerial bombs, the sharp crack of machine guns and the cheers of residents assembled from all over Long Island. The song "Good-bye Choo-Choos," arranged for this occasion, was popular. Headed by the Sunrise Trail Band, composed of 60 employees of the railroad, the celebrants marched to the athletic field under escort of a cavalry troop from Brooklyn, the local fire and police departments and numerous bodies of boy and girl scouts. Chester O. Ketcham, chairman of the reception committee, read an address of welcome from the village president. Several railway officials replied.

To provide the electric passenger train service between Jamaica and Babylon on the Montauk division of the Long Island Railroad has called for an expenditure of approximately $5,000,000. Authorization to electrify this branch, which includes a two-track line 28 miles long, was given by the board of directors in April, 1924. Work of preparing specifications and plans was begun immediately, and the construction of new substations, transmission lines and distribution systems was started early in June, 1924. Practically all the work has been carried out by the railroad construction forces and has been completed in the remarkably short time of a year. To break in the new equipment, a trial train has been operated since May 5, but service was not inaugurated until last Wednesday.

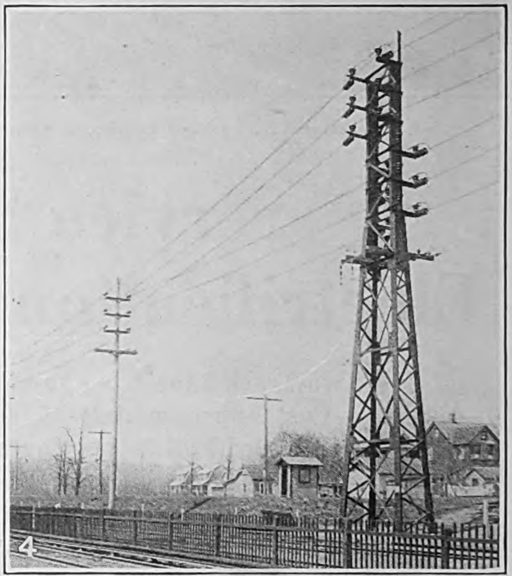
Six new substations have been built, together with two transformer stations for increasing the transmission line voltage from 11,000 to 33,000. These stations are located at Laurelton, Lynbrook, Freeport, Wantagh,

Substation and Construction Features of New Long Island Railroad Electrification


1



2


4

3

No. 1. Substation at Wantagh with high-voltage equipment at side.

No. 2. Lack of ground space made it necessary to install equipment on roof of substation at Lynbrook.

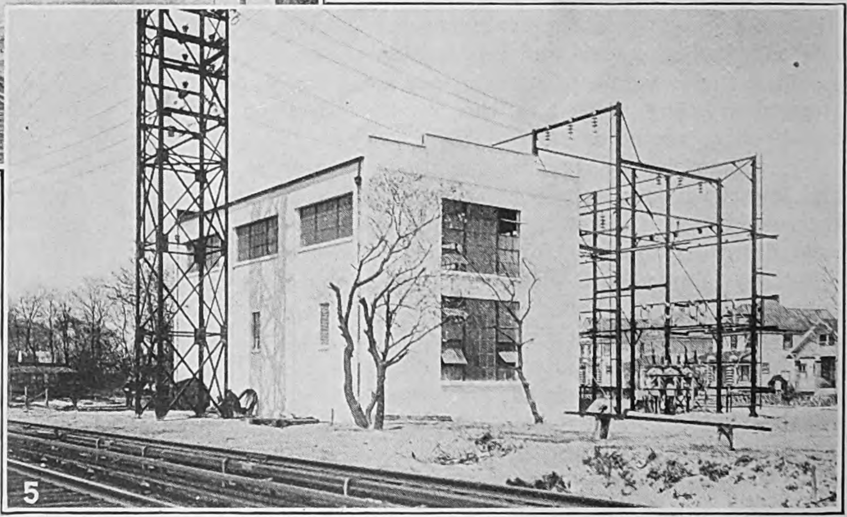
No. 3. Double-track construction with third rail was used throughout.

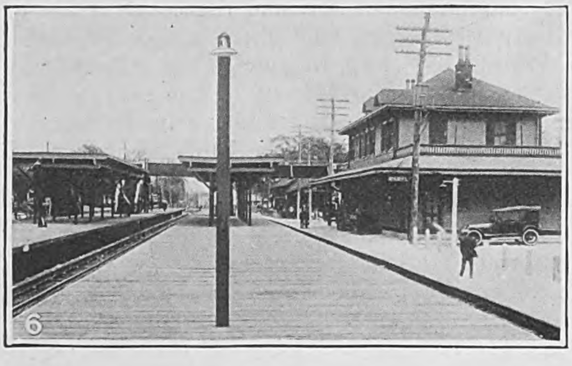
No. 4. Transmission tower designed to take dead-end strains provides for two taps to switching station at Valley Stream.

No. 5. Steel tower construction at side of Amityville substation supports overhead wires.

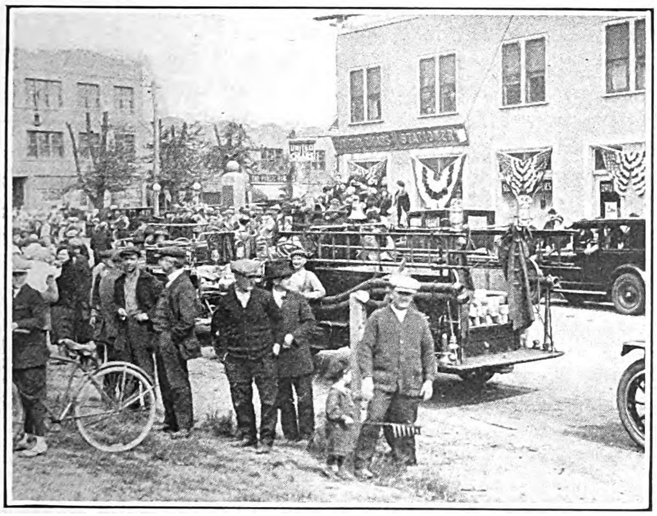
No. 6. New high-level platforms constructed at Babylon station.

No. 7. Third rail and protection board construction at Baldwin station.

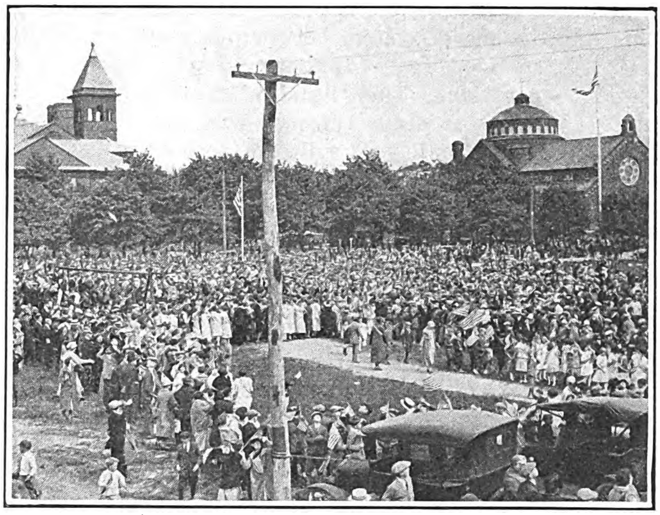

5


6

7



Local Fire Departments Were Assembled at Nearly All Stations Along the Line. This View Is of Rockville Center

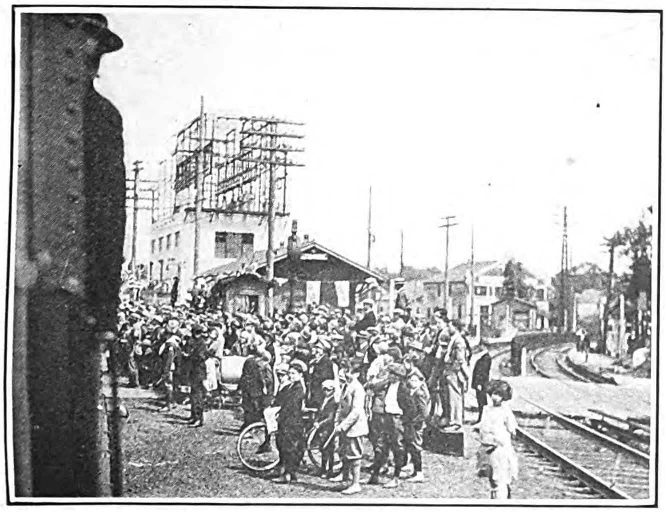


Crowds Gathered at the Athletic Field in Babylon for Jubilee Exercises and Speeches by Prominent Officials

Amityville and Babylon. These substations include the latest practice in design. All high-voltage equipment and connections have been placed outdoors and the stations themselves present an imposing appearance. The substation buildings are reinforced concrete and contain the rotary converters, low-voltage switching equipment, etc. With the exception of the substation at Lynbrook, all have the high-voltage equipment placed on the ground at the side or end of the substations. At Lynbrook, however, space did not permit of this construction, and so the equipment was mounted on the roof of the substation. The total capacity of all converters installed in the six new substations is 20,000 kw. and an additional 2,000-kw. unit has been installed in the Cedarhurst substation. All the major items of electrical equipment were furnished by the Westinghouse Electric & Manufacturing Company, and about 1,000,000 lb. of fabricated steel was furnished by the Pittsburgh Steel Mills for use in the substations and transformer stations.

This electrification required the construction of a new transmission line from Lynbrook to Babylon and the rebuilding of the existing lines from Rockaway Junction to Wreck Lead and from Valley Stream to Lynbrook. More than 18½ miles of new transmission lines have been added to the system, and this construction required 900 wooden poles, 60 steel poles and 130 miles of bare copper wire. To provide additional transmission line capacity between the power house at Long Island City and the Rockaway Junction substation 3.2 miles of underground conduit was constructed between Whitepot Junction and the Dunton arrester house, and two underground cables with a total length of 120,920 ft. were installed. These cables contain three wires for the transmission of 11,000-volt power. The wooden poles used for the construction of the transmission lines came mostly from Idaho, the steel poles from Pittsburgh and the copper for both the overhead and underground transmission systems from Montana.

The third-rail construction follows the standard used by the Long Island Railroad on its other lines, which consists of an over-running third rail with a protecting board. For power transmission 296,000 ft. of third rail and 315,000 ft. of protecting board were used for the new electrification. Other material used in third-rail construction work included 39,500 insulators and brackets for supporting the rail and holding the protecting board in position, 24,000 ft. of conduit and 25,400 ft. of insulated copper cable. Highway crossings are at grade and cable in conduit is necessary for making connections between adjacent ends of third rails at crossings. The third rail weighs 150 lb. per yard and was rolled at the plant of the Bethlehem Steel Company at Steelton, Pa., 13,000,000 lb. being used.



The Lynbrook Substation Formed a Background for the Crowds Assembled to Greet the First Electric Train

Flag-Draped Stations and Buildings Added to the Holiday Spirit of Electrification Day

In order to provide for efficient signal operation along this line the signal system between Jamaica and Babylon was changed from direct current to alternating current operation. The signal voltage is 2,200 volts and 18½ miles of signal circuit was installed, which requires approximately 42 miles of new wire.

The rolling stock to be used on this new electrified line is of the Long Island Railroad's latest type, which was described in ELECTRIC RAILWAY JOURNAL for Feb. 2, 1924. In anticipation of the inauguration of the new electric service to Babylon 40 new steel motor cars were purchased recently and 60 steam coaches were converted into trail cars for use in electric service. The standard make-up for electric train operation of the Long Island Railroad is one trailer to two motor cars. Each motor car weighs approximately 115,000 lb. and is 64½ ft. long. The trailers weigh 70,000 lb. each and are approximately of the same length. The seating capacity of both motors and trailers is 78 passengers.

In order to provide for the transfer of passengers from steam trains to electric at Babylon, and also properly to handle the traffic incident to the new electrification, it was necessary to reconstruct the Babylon station. The station building was moved about 15 ft. and a new low-level cinder and screening platform was installed next to the station for incoming Babylon passengers who use the electric trains. For interchange passengers, two high-level island platforms were constructed and an overhead foot bridge with stairways was provided to connect to these island platforms. All platforms are of sufficient length to take eleven-car trains, and the island platforms are partly sheltered.

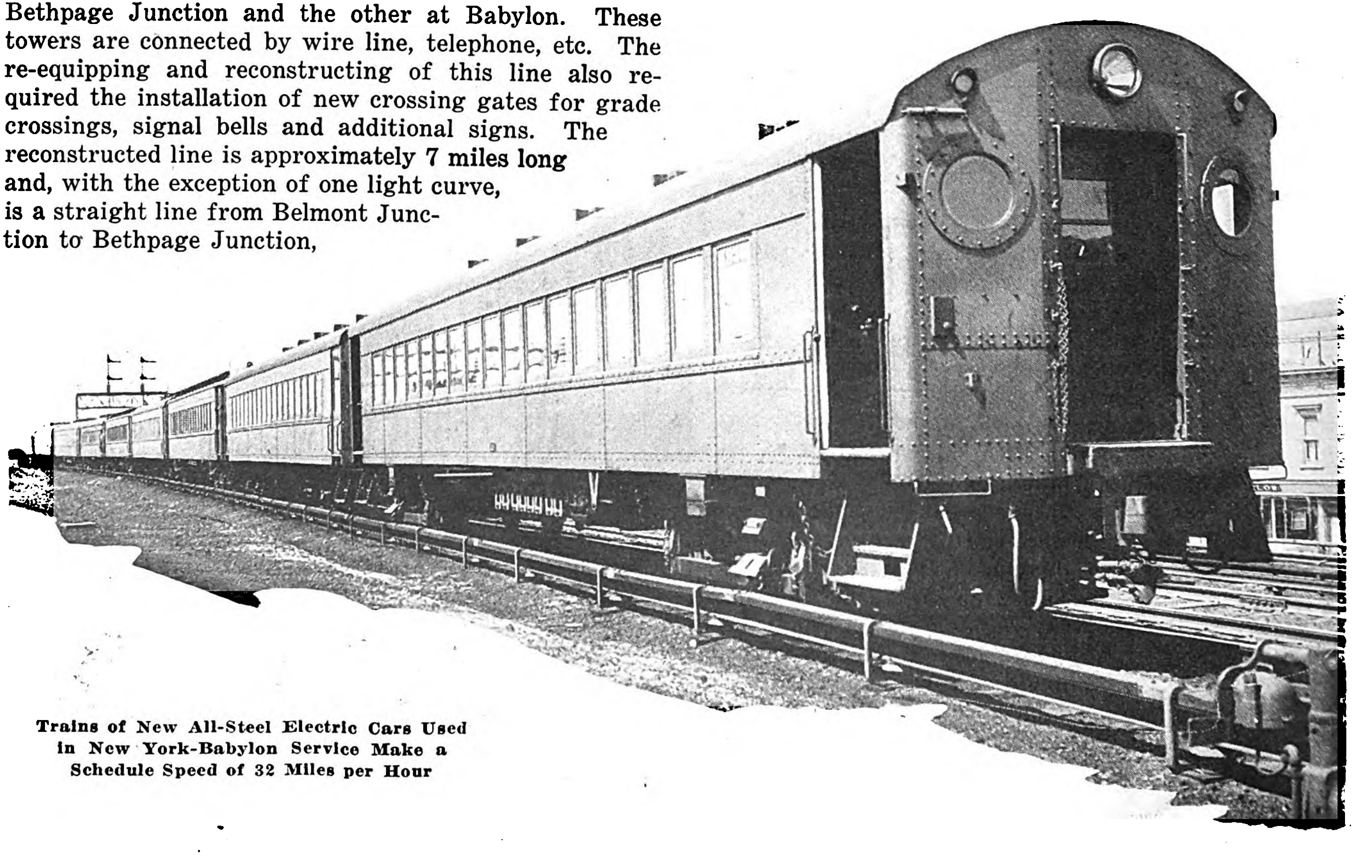
For the operation of steam trains to and from points east of Babylon, the old Central Extension Railroad between Babylon and Bethpage Junction has been completely rebuilt. New 100-lb. rail was used in track construction, with creosoted ties and other track fittings. This line is controlled at each end by signals and interlocking plants, one tower being located at Bethpage Junction and the other at Babylon. These towers are connected by wire line, telephone, etc. The re-equipping and reconstructing of this line also required the installation of new crossing gates for grade crossings, signal bells and additional signs. The reconstructed line is approximately 7 miles long and, with the exception of one light curve, is a straight line from Belmont Junction to Bethpage Junction, at which point it is connected by curves to both the main line and the Montauk division.

The electrification of the Montauk division between Jamaica and Babylon and the consequent change of motive power from steam to electricity, together with the routing of express trains to and from points east of Babylon by way of the new line, increases the capacity of the whole Long Island Railroad system. Congestion at Jamaica is reduced through the elimination of trains which formerly were required to transfer passengers from steam to the electric service on this branch. Delays to trains also are eliminated through the reduction of stops that steam trains make. This arrangement provides that where steam and electric service are operated over the same lines the local trains cannot interfere with the usual schedule of passenger trains. The railroad management has made no special attempt to reduce the running time of trains, but has worked out a schedule which will be dependable. The schedule speed of electric trains is 32 m.p.h.

With this new electrification, the Long Island Railroad will have more than 300 route-miles of electrified track. The electrification to date has required an expenditure of approximately $25,000,000.

A noteworthy feature of the electrification is the unusually rapid growth of population along the electrified lines. During the twenty years that the Long Island has been instituting electric service the population of Long Island, particularly in the communities served by electric trains, has risen enormously, as is shown in the accompanying table giving the number of commuters which were carried in 1905 and 1924. Twenty substations have been erected to date, and the combined rated capacity is 91,500 kw. The electric rolling stock now used consists of 905 cars. These include 615 steel motor cars, 52 combination steel motor cars, 17 baggage cars and 221 trailers.

Power for the Long Island electric operation is furnished by the power house of the Pennsylvania Railroad.

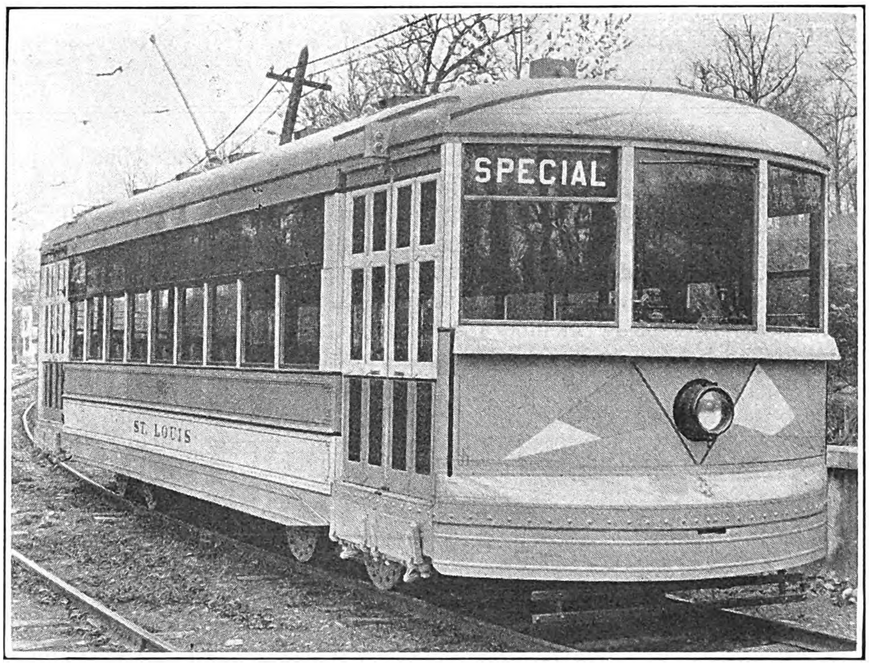


Trains of New All-Steel Electric Cars Used in New York-Babylon Service Make a Schedule Speed of 32 Miles per Hour

Many Innovations in Grand Rapids Cars

THIRD ARTICLE

The Sample Car Built by the St. Louis Car Company, While Similar to the Other Entries in General Design, Differs in Many Important Details from the Cars Built by the Light Weight Noiseless Electric Street Car Company and the Kuhlman Plant of the J. G. Brill Company, Described Previously



A Skirt Extending from the Side Sill and Under the Bumper on the St. Louis Car for Grand Rapids Partially Hides the Running Gear

LIKE the two others submitted in the Grand Rapids competition, the St. Louis car is arranged for single-end operation and is of the one-man, two-man type. This car is a few inches longer than the two others, measuring 37 ft. 11 in. over bumpers. This is accounted for by the use of 31½-in. side post and cross seat spacing. It is 8 ft. 6 in. wide over the side sills and 10 ft. 8½ in. high from rail to top of trolley boards. The scale weight is 25,460 lb. completely equipped. An arrangement consisting of a combination of cross seats in the middle with longitudinal seats near the doors gives a seating capacity for 44. This includes a removable lift-out seat installed back of one of the rear doors, for use when only one door at the rear end is required. Seats are upholstered in Fabrikoid. The cross seats are 36½ in. wide, leaving a 27-in. aisle. For the operator of the car a bus type upholstered seat is provided.

Extending across the entire end of the vestibule a cabinet has been built between the vestibule corner posts, with the top approximately at the height of the belt rail. This incloses all piping and apparatus on the vestibule, including the controller. The controller top, brake valve and air gage are mounted flush on the top of the cabinet and the hand brake operating wheel extends through the front face in a position convenient to the operator. A panel-type heater is also mounted in the front face of this cabinet and a small drawer is provided for such supplies as transfers and tickets. Doors in the face of the cabinet allow access to the apparatus and the air piping inside. A bulletin frame similar to that used on the two other cars is mounted directly behind the operator.

As in the case of the previously described cars, a variety of operating methods is permitted by the door control arrangement. National Pneumatic engines are used with the double folding doors at both ends. A type M-28 brake valve is a part of the full safety devices equipment, and there is included a selector valve which allows a one-man operator to have selective control of the doors at each end. In addition, a conductor's valve controls the rear doors independently when the car is handled by two men. An outside street collector's valve permits collectors stationed at busy intersections to open the rear doors when the car is operated by one man. An exclusive feature of this car is the back-up device. This enables the car, which has only one controller, to be backed from the rear end on the first controller point. A small switch and a second brake valve mounted at the rear end are provided for this purpose. The arrangement is similar to that on the Illinois Valley cars of the Illinois Traction System, described in ELECTRIC RAILWAY JOURNAL for Jan. 10, 1925, page 51.

Below the belt rail, on the outside of the car, the side sheets are 1/16-in. steel. A sheet steel skirt, 10 in. wide, extends below the side sill, partly hiding the trucks and wheels. This skirt is also carried around under the bumpers at the front and rear ends. At the belt rail line on the front dash a projecting sheet steel cover conceals five lamps. These illuminate the dash at night, setting off strikingly the blue and white pennants, representing the colors of St. Louis University, and which are painted on a background of gray. The side panels are painted in blue and white and a pennant effect is also painted on the rear dash.

An accompanying cross-section drawing shows the general side framing construction. The side posts are of wood. A longitudinal furring strip is carried between the belt rail and the side sill to support a rubbing strip outside the steel side sheets. The 13/16-in. single yellow-pine floor is covered with green and black mosaic rubber tiling. The body floor is carried the entire length of the car, with a 2-in. ramp from the center line to the door openings. This makes the step height 15½ in. from the rail to the outside folding step, and 15 in. from the step to the floor.

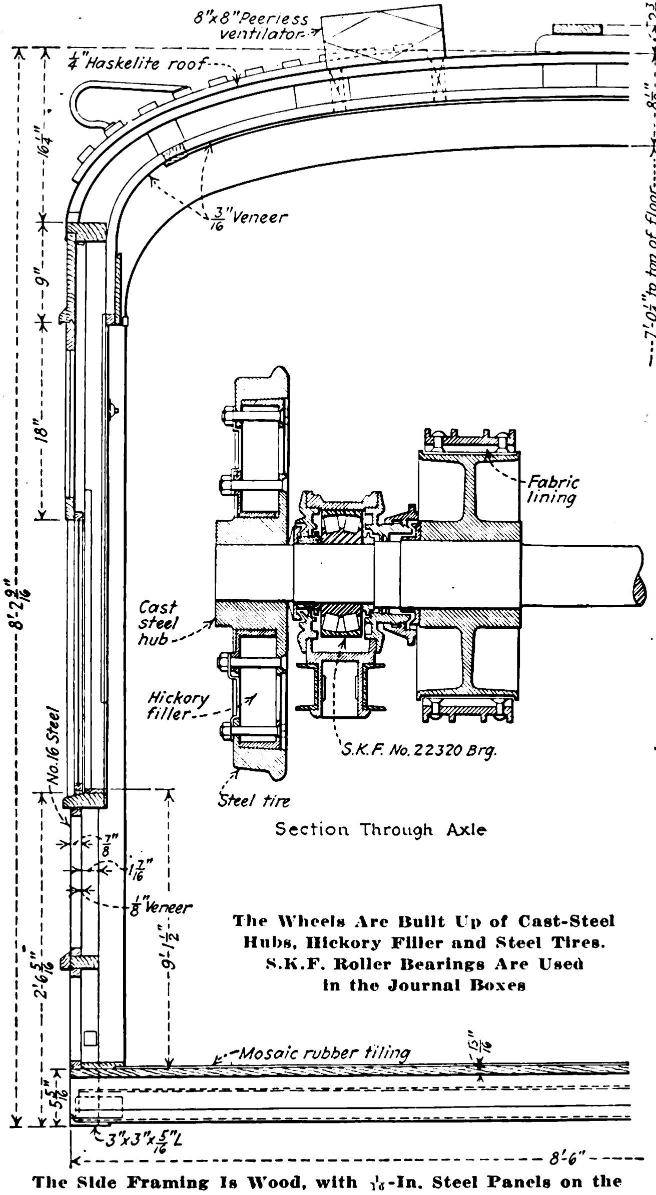
The lower sash are all brass, both in the body and vestibule. In front of the motorman, ½-in. plate glass is used to prevent fogging and frosting. The upper

WEIGHT, DIMENSIONS AND SPECIFICATIONS ST. LOUIS SAMPLE CAR FOR GRAND RAPIDS RAILWAY

Type of car	One-man, two-man, single end
Length over all	37 ft. 11 in.
Width over side sills	8 ft. 6 in.
Height from rail over trolley boards	10 ft. 8¼ in.
Weights:	
Body and equipment	12,660 lb.
Electrical equipment	4,760 lb.
Trucks	6,840 lb.
Air brakes	1,200 lb.
Total	25,460 lb.
Armature bearings	Hyatt roller at pinion end and ball at commutator end.
Announcer	Whiteland loud speaker
Air brakes	Westinghouse DH-16 with fabric lined clasp shoe brakes on the axle drum, full safety devices, back-up device on rear end and selector valve for door control,
Buzzers	Faraday
Center and side bearings	St. Louis oil retaining center bearing and roller side bearings.
Control	K-35-G2
Curtain fixtures	Curtain Supply Company "Rex"
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic and St. Louis Car Company
Fare box	Woods
Fenders	H-B lifeguards
Floor covering	Mosaic rubber tiling
Gears	G. E. hollow noise deadening
Gong	Electric Service Supplies Company manual and pneumatic
Hand brakes	Peacock staffless
Heater equipment	Consolidated Car Heating Company
Headlights	Crouse-Hinds
Headlining	Three-ply veneer
Interior trim	Mahogany
Journal bearings	S. K. F. roller bearings
Power-saving device	Economy meter
Journal boxes	Inside of wheels
Light reflectors	Braskelite
Motors	G.E. 258-F
Motorman's seat	St. Louis, bucket type
Paint	Ditzer Color Company and Valentine varnish
Rear signals	Oskelite
Roof	¼-in. Haskelite
Sanders	St. Louis Car Company
Sash	Curtain Supply Company, brass
Sash Fixtures	Curtain Supply Company
Seats	St. Louis Car Company, stationary
Seating material	Fabrikoid
Stanchions	Porcelain enameled
Step treads	Kass safety
Track scraper	Root pneumatic
Trolley catchers	Trolley Supply Company, Ideal
Thermostat	Consolidated
Trolley base	Ohio Brass Company
Trucks	St. Louis Car Company type GR-54
Ventilators	Peerless
Window wiper	St. Louis
Wheels	St. Louis Car Company's silent type
Warning signal	Bosch Ula-6 horn

sash are continuous wood framed. The carlines are also made of wood. These support a ¼-in. Haskelite roof and are finished on the interior of the body with 3/16-in. veneer. Below the belt rail the side lining is ⅛-in. veneer. Center mounted, Braskelite semi-indirect lighting fixtures furnish the interior illumination.

Light steel framing members make up the underframe. The bolster is built up, with 6-in. x 1-in. top and bottom plates. Crossings are 3-in., 4-lb. channels, fastened to the 3-in. x 3-in. x 5/16-in. side sill angles with gussets and spaced on centers varying from 3 ft. 3 in. to 3 ft. 9 in. The end sills are 3-in. 5-lb. channels, and diagonal braces made of 2-in. x 2-in. x 5/16-in. angles extend from the body corners to the center of the bumper at each end.


8"x8" Peerless ventilator
¼" Haskelite roof
3/16" Veneer
16¼"
9"
18"
8'-2 9/16"
No.16 Steel
7/8"
1 1/2"
⅛" Veneer
9'-1½"
2'-6 5/16"
5 5/16"
Mosaic rubber tiling
15/16"
3"x3"x5/16" L
8'-6"
2¾"
8½"
7'-0¼" to top of floor
Fabric lining
Cast steel hub
Hickory filler
S.K.F. No. 22320 Brg.
Steel tire

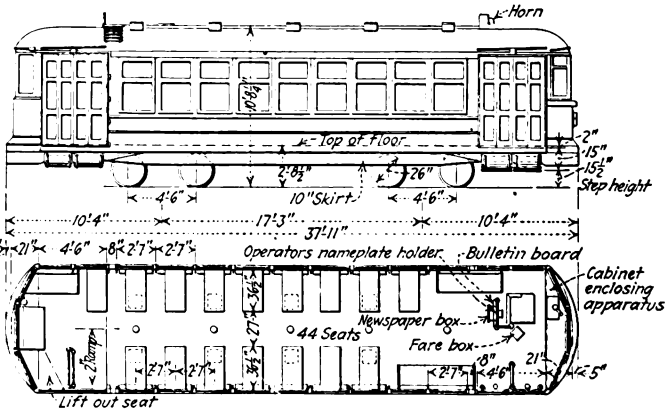
Section Through Axle

The Wheels Are Built Up of Cast-Steel Hubs, Hickory Filler and Steel Tires. S.K.F. Roller Bearings Are Used in the Journal Boxes

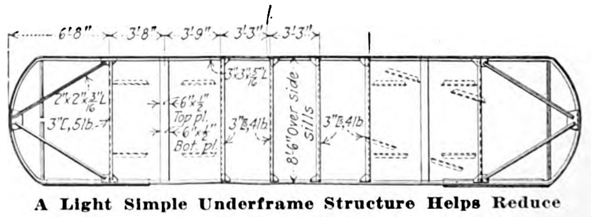
The Side Framing Is Wood, with 1/16-In. Steel Panels on the Outside Below the Belt Rail

Some wide departures from conventional practice are made in the special St. Louis trucks, which include a number of ingenious and patented innovations. As in the case of both other sample cars, inside journal boxes, roller journal bearings and fabric lined clasp brakes operating on axle mounted brake drums are used. For each car, however, the design has been worked out somewhat differently.

In the St. Louis truck the journal bearings are S.K.F. rollers. Although the side frames are of arch bar construction, they are equalized by being carried in guides on the sides of the journal boxes, with helical springs between the ends of the frames and the channel equalizer bars below. Thus the two journal boxes on each side of the truck form what is in effect a wide pedestal, with the side frame mounted between. These side frames are tied together across the truck with angle transoms, stiffened at the corners with gussets.


Horn
Top of Floor
2"
15"
15½"
Step height
4'6"
10"Skirt
2'8½"
26"
10'4"
17'3"
37'11"
Operators nameplate holder
Bulletin board
Cabinet enclosing apparatus
Newspaper box
44 Seats
Fare box
2'7"
21"
4'6"
Lift out seat
Ramp

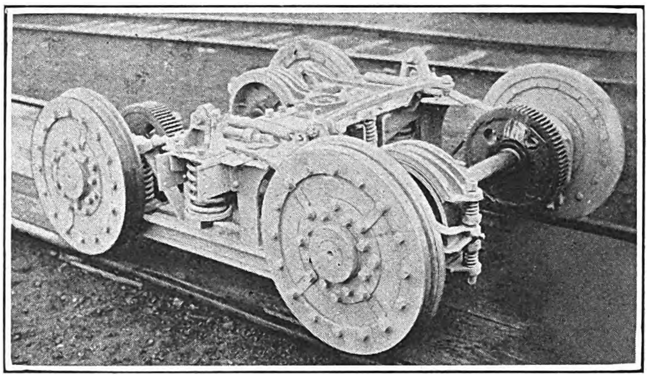
The Car Is 37 Ft. 11 In. Long Over the Bumpers and Seats 47 Passengers. It Is Single End and Is Arranged for One-Man, Two-Man Operation


6'8"
3'8"
3'9"
3'3"
3'3"
2"x2"x3/16" L
3"C,5lb.
6"x½" Top pl.
6"x½" Bot. pl.
3"C,4lb
8'6" Over side sills

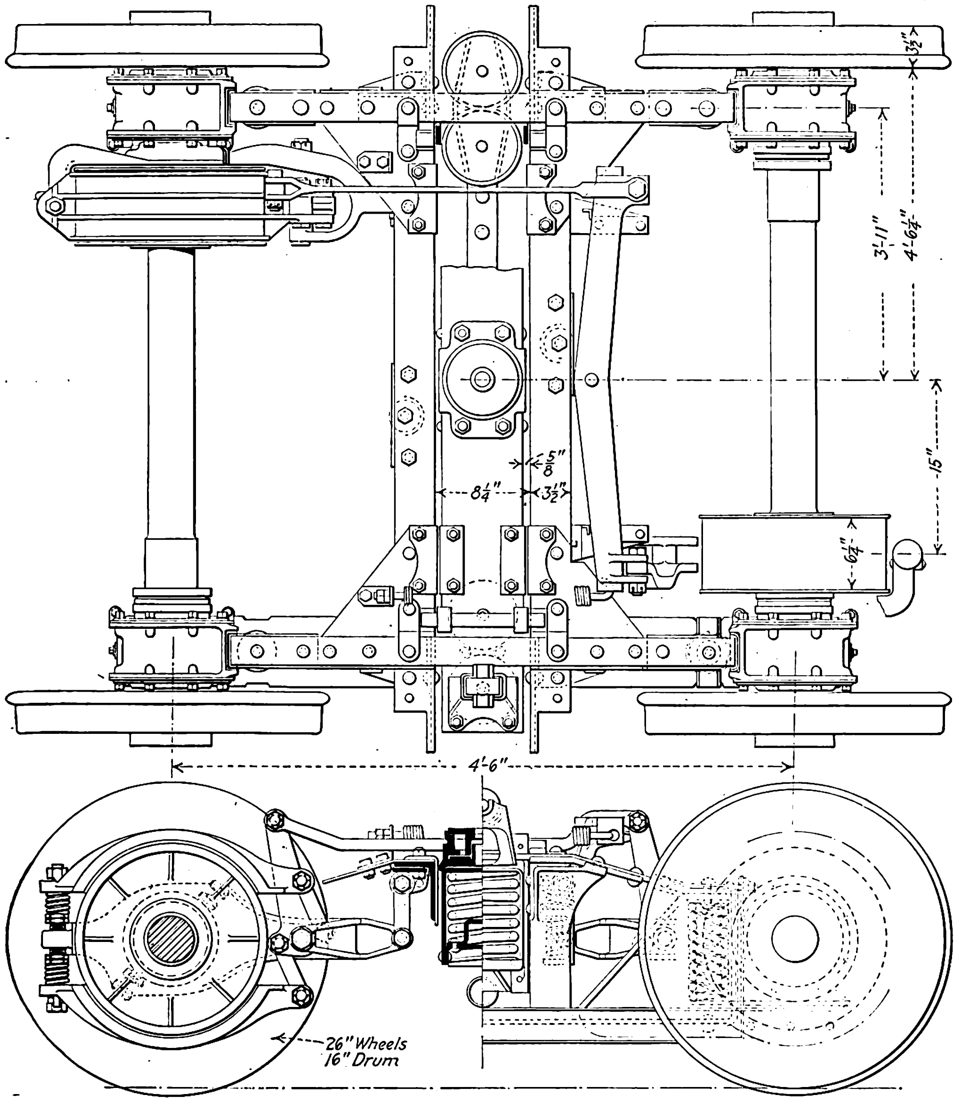
A Light Simple Underframe Structure Helps Reduce the Body Weight

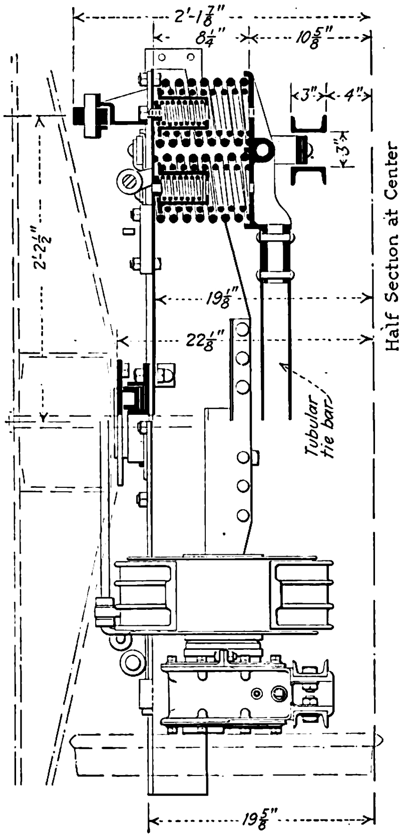
The built-up box type bolster is supported at each end on a pair of nested helical springs. These rest on rugged, cast steel spring pads below, which in turn are carried on swing links from the transoms. The spring pads are tied together across the truck with a tubular steel member, as shown in the cross-section drawing. Each nest of springs consists of three units—two long springs of large diameter and heavy material and a third spring carried in a cup extending down only about half way inside the two others. This arrangement provides a light load graduating device. The second spring is slightly shorter than the one on the outside and supports on its top the hollow cup containing the third short spring. The latter extends above the top of the cup in contact with the top spring cap under the bolster. Consequently slight jars under light load are taken by the light load spring. Increase of load, however, soon brings the top of the cup in contact with the spring pad, cutting out the small spring until the load again decreases. No elliptic springs are used in the truck.

Fabric lined clasp shoe brakes are operated from a toggle linkage mechanism mounted on a split yoke which is carried on a collar on the inside face of the journal box. On one side of the brake drum this yoke forms a bracket which supports the dead ends of the brake shoes through a spring adjustment device. On the opposite side of the drum is mounted the linkage mechanism for operating the shoes. A projection of the yoke is supported from the truck transom through a swinging link. Thus the yoke is free to rotate about the journal box collar, as the truck frame moves up or down on the journal box springs. In addition, helical springs at the back ends of the shoes allow them to assume an equalized position to compensate for slight differences in the angularity of the toggle links when the brakes are applied. These springs are also adjustable to center the shoes on the drum when released. Adjustment for wear is by means of a single bolt. The shoes are lined with ½-in. x 6-in. "Hyco" brake lining, manufactured by the Manhattan Rubber Company.



Helical Springs Are Used Exclusively in the St. Louis Truck. The Side Frame Is Carried on Springs Near Each Journal Box, Which Rest on the Equalizer Bar Below

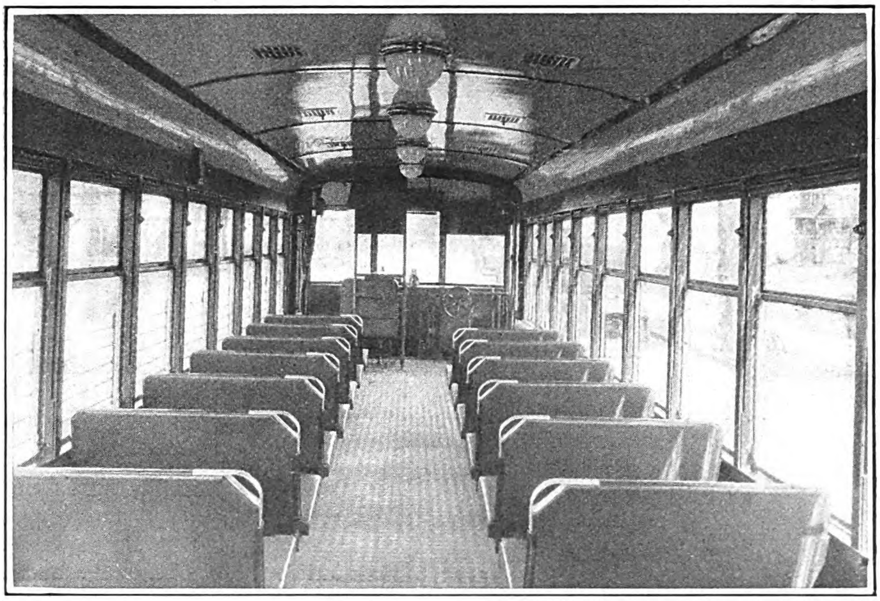




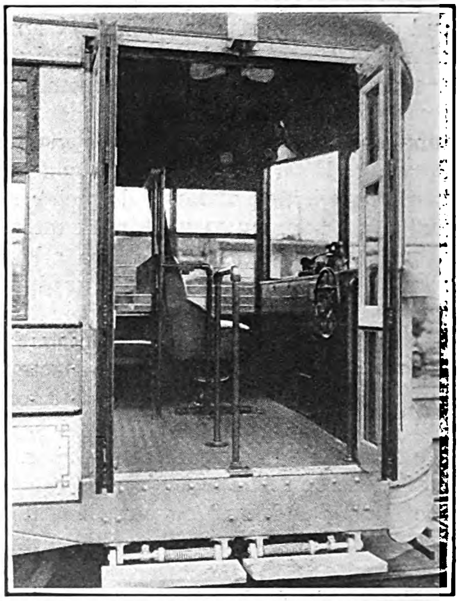
Light Load Graduation Arrangement to Improve Riding Is Provided by Helical Springs

Features of the Special Truck

The fabric-lined clasp brakeshoes are supported on a spit yoke around a collar on the inside journal boxes. This yoke is supported from the transom by a link which leaves it free to rotate sufficiently to equalize the pressure on the upper and lower shoes.



Interior of the St. Louis Car for Grand Rapids
Seats are upholstered in Fabrikoid. Mosaic rubber tiling covers the floor. Braskelite fixtures furnish the interior illumination. The bulletin board and stand common to all three cars is shown back of the operator's position.



All the Operating Mechanism Is Incased in a Cabinet. The Doors Can Be Controlled Individually if Desired.

To reduce the noise made by metal wheels on the rail, a wheel built up of wood and steel is used. The section drawing through the wheel illustrates the design employed. The hub is cast steel with flanges to support the hickory filler, to which the steel tire is in turn bolted. Ground straps between the tire and the hub complete the electrical connection to the rail.

Four General Electric 258-F, 25-hp. motors are equipped with Hyatt roller armature bearings on the pinion end and ball bearings on the commutator end. The control is G.E. type K-35-G2, and the compressor is Westinghouse type DH-16.

Overhead Catenary Material Tested

EXTENSIVE tests of overhead catenary material are now being made under the auspices of the General Electric Company and various manufacturers. Wear tests are in progress at the company's works in Schenectady upon contact wires made up of various materials. These results are expected to show the comparative wearing qualities of the different metals. An accelerated corrosion test of primary messenger cables has been arranged for at the New York Central Railroad engine house at Collinwood, Ohio. Short lengths of these cables, together with a section of galvanized steel cable, will be tested in a smoke jack over a stall where a steam locomotive usually stands, being subjected to smoke, steam and gases.

Current collection tests were made recently at Erie, Pa. Overhead catenary construction was installed by the Copperweld Steel Company, American Steel & Wire Company, American Brass Company and the Aluminum Company of America. This was arranged to provide for a total conductivity of 1,554,000 circ.mils, included entirely in the catenary construction rather than in feeder cables installed in duct lines or aerial lines paralleling the right-of-way.

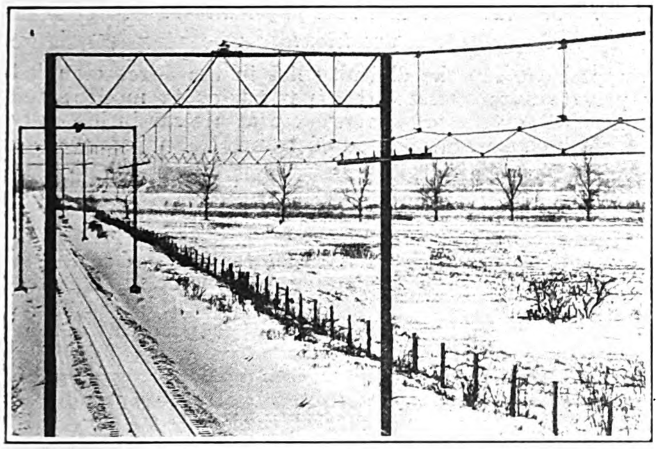
Each company installed two or more spans of 300 ft. each, conforming generally to the experimental laced catenary construction which proved successful with the heavy current collection tests described in ELECTRIC RAILWAY JOURNAL for July 28, 1923, page 125. The various manufacturers installed cables made up of different metals considered the most suitable for overhead catenary construction. All cables and wires installed have non-corrosive qualities and, being subjected to smoke from steam locomotives and also to weather conditions, the comparative corrosion of the different metals will be obtained. A considerable period of time will be required, however, to determine the corrosive results.

The catenary system used for the test was designed to have a total conductivity equivalent to that of 1,554,000 circ.mils of copper, as previously mentioned; a messenger sag of 6 ft. at 60 deg. F. with no wind, and a

MATERIALS USED IN CATENARY TESTS

	Copperweld Steel Company	American Steel & Wire Company	American Brass Company	Aluminum Company
Primary Messenger Cable				
Material	Copperweld Steel	Galvanized Steel	Bronze	Galvanized Steel
No. wires	7	19*	13	19
Diameter, in.	0.204	0.119	0.131	0.128
Material	Copper	Copper	Copper	Aluminum
No. wires	12	44	48	42
Diameter, in.	0.204	0.1065	0.131	0.128
Ultimate strength, lb	55,300	60,000	59,000	49,500
Elastic limit, lb	33,200	36,000	35,000	37,400
Modulus of elasticity	16,000,000	14,000,000	14,300,000	30,000,000
Over-all diameter, in	1.02	1.04	1.179	1.123
Weight per foot, lb	2.366	2.377	3.22	1.411
Conductivity, circ.mils	586,000	524,000	824,000	437,000
Feeder Messenger Cable				
Material	Copper	Copper	Copper	Aluminum
No. wires	19	19	19	37
Diameter, in.	0.150	0.1622	0.1206	0.160
Over-all diameter, in.	0.73	0.815	0.513	1.12
Weight per foot, lb	1.350	1.543	0.618	0.889
Conductivity	437,200	500,000	200,000	590,000
Lacing Cable				
Material	Copper	Copper	Copper	Aluminum
No. wires	19	19	19	19†
Diameter, in.	0.0747	0.0747	0.0747	0.100
Over-all diameter, in	0.373	0.373	0.373	0.500
Weight per foot, lb	0.327	0.327	0.327	0.197
Conductivity	106,000	106,000	106,000	112,000
Contact Wire				
Material	Grooved hard-drawn copper			
No wires	2	2	2	2
Size	0000	0000	0000	0000
Diameter, each, in.	0.482	0.482	0.482	0.482
Weight per foot (2), lb	1.28	1.28	1.28	1.28
Conductivity (2), circ.mils	424,000	424,000	424,000	424,000
Total weight of span per foot, lb	5.723	5.927	5.798	3.99
Total weight of span per 300 foot, lb	0.1717	0.1778	0.1739	0.1197
Total conductivity, circ.mils	1,553,200	1,554,000	1,554,000	1,563,000

*Includes one wire of 0.125 in. diameter.
†Includes one galvanized steel wire of 0.1 in. diameter.



Laced Catenary Construction Installed for Tests at Erie

factor of safety of three under the following maximum conditions: ½ in. of ice on all parts, 8 lb. per sq.ft. wind load and a temperature of 0 deg. F. Its appearance is shown in an accompanying illustration.

The first four tests included operation of a train at slow and fast speeds with low and high current collection. Speed data are given in the following table. One pantograph was used in the first three tests and two in the fourth:

Mile Post	Time			Speed M.P.H.		Current, Amp.
	Hours	Minutes	Seconds	Instantaneous	Average	
1.2	3	25	12	20	30	2,650
1.3	3	25	30	28		
1.4	3	25	40	31		
0.8	3	54	45	16	30	4,000
1.0	3	55	15	21		
1.2	3	55	37	27		
0.4	4	09	14	14	65	2,700
0.6	4	09	31	31		
0.8	4	10	50	50		
1.0	4	10	60	60		
0.4	3	39	18	16	60	5,400
0.6	3	39	48	32		
0.8	3	40	8	52		
1.0	3	40	20	62		

Stationary tests were then made under the various exhibits. With a train standing under the middle of the Aluminum company section using two pantographs 5,300 amp. were collected. After five seconds the wheels slipped. A second attempt was made to hold 5,300 amp. for 30 seconds, but again the wheels slipped after five seconds. The third attempt was made, using one pantograph collecting 5,000 amp., and once more the wheels slipped after five seconds. For this test the resistance grids in a gondola car were loaded to full capacity, then the controller of the locomotive was notched up to get 5,300 amp.

A train standing under the middle of the American Brass Company section using one pantograph collected 6,000 amp. for 30 seconds. Under the American Steel & Wire Company section, using one pantograph, 5,200 amp. were collected for 30 seconds, and under the Copperweld Steel Company section 5,300 amp. were collected for 30 seconds.

Sales Letter Sent to Beaver Valley Employees

C. D. SMITH, general manager of the Beaver Valley Traction Company, New Brighton, Pa., on May 7, 1925, addressed to the employees the following letter about selling the service of the railway:

It costs approximately 42 cents for every mile that a street car operates. The heavier cars cost more and the smaller cars less, but the average is 42 cents per mile. That means that it costs that amount to transport one passenger one mile if he is the only one on the car, and some of our men know of trips where they have run a mile without a passenger.

We need passengers, plenty of them, all classes of them, at all times of the day. You can find some of these new passengers.

STOP - THINK

Don't you know of some one who is not using our cars to any great extent, if at all? Certainly you do. Well, then, it is your job to sell that person our street car service. Go at him, and if you need any help call on me or any other member of our organization.

We have a service of which we are proud. Let's prove this by selling it. Thanks!

Traffic Congestion Studies in Detroit

H. M. Gould, Assistant General Manager Department of Street Railways, Detroit, Mich., Discusses Relations of Buses and Electric Cars and Relative Space Occupied by Different Vehicles on Streets

CONGESTION on the streets of Detroit is as acute as it is in other cities. Perhaps it is more acute in Detroit than in many other large communities, because Detroit is very much of an automobile city. It is the home of many large automobile factories. Its streets are well paved and encourage automobile usage.

In its present campaign to secure better street conditions, the Department of Street Railways, Detroit, which operates all of the electric car lines within the city limits, is emphasizing greater economy of street space of the trolley car and bus as compared with the private automobile. Some of these facts are being brought out in a series of bulletins issued to its operating and division employees, known as "Economics Thoughts." These bulletins are signed by H. M. Gould, assistant general manager.

Economics Thought No. 2, issued April 4, 1925, was the first of these bulletins to discuss street congestion. In it, Thomas P. Henry, president of the American Automobile Association, is quoted as follows:

> *There are too many varieties of passenger-carrying units in traffic.* There is the street car, the automobile, the bicycle, the horse-drawn vehicle, and most illogical of all, the street railroad train at grade crossings. *If these are not to give way to one type,* then they must be segregated for the safety of the public.

The suggestion is then made to reduce the number of units as well as the variety, and a table is given of the street space taken by different vehicles, taken from an article by Daniel L. Turner in the ELECTRIC RAILWAY JOURNAL for June 9, 1923. A photostat of the portion of this article descriptive of the figures accompanied the bulletin.

A reprint of Economics Thought No. 3, issued on April 22, 1925, follows:

CITY OF DETROIT
Department of Street Railways
RAIL AND COACH LINES
To Operating and Traffic Division Employees
of the Department of Street Railways:

ECONOMICS THOUGHT NO. 3
How Can We Relieve Traffic Congestion?
How Can We Bring About Some Sort of Rapid Transit, at Least Until Subways Are Built?

You will recollect that Economics Thought No. 2 called attention to "Street Space Occupied by Cars and Buses," and that Mr. Turner called particular attention to the uneconomical use of street space by the passenger carrying automobile and the taxicab.

In *Economics Thought No. 3*, we are going to invite your attention to the situation here in Detroit by quoting some figures taken from the Rapid Transit Commission's report of October 15, 1924, which covered a traffic count taken June 13, 1924, showing traffic entering and leaving the business district bounded by Cass, Columbia, St. Antoine and the Detroit River.

The portion of the report which is used in this discussion is given below:

TRAFFIC MOVEMENT IN PEAK HOUR, 5 TO 6 P.M., OUTBOUND FROM BUSINESS DISTRICT

Transportation	Passenger Carrying Vehicles Only Vehicles	Per Cent	Persons	Per Cent
Individual				
Passenger automobiles	10,529	86.91	18,281	24.24
Taxicabs	499	4.12	485	0.64
Total	11,028	91.03	18,766	24.88
Collective				
Jitneys	301	2.49	1,713	2.27
Buses	148	1.22	7,890	10.46
Street car trains*	637	5.26	47,062	62.39
Total	1,086	8.97	56,665	75.12
Grand total	12,114	100.00	75,431	100.00

*Approximately 800 cars.

JUST LOOK AT THOSE FIGURES!!

Don't be like the fellow who owned the watch and who couldn't tell time, when asked by his friend, "What time is it?" pulled out the watch and showing it to his friend (who couldn't tell time either), said, "There you be!" The friend looked at the watch and said, "Darned if it ain't!"

The figures just given say more than "Darned if it ain't!" The passenger automobiles comprised 86.91 per cent and carried 24.24 per cent. The buses comprised 1.22 per cent and carried 10.46 per cent. The street car trains comprised 5.26 per cent and carried 62.39 per cent.

Supposing we check up on the street space used by the various types!

AREAS OCCUPIED BY VEHICLES

Kind	No. of Vehicles	Average Area Sq. Feet	Total Area Sq. Feet	Passengers Carried
Passenger autos	10,529	78.2	823,367.8	18,281
Jitneys	301	78.2	23,538.2	1,713
Total	10,830	.....	846,906.0	19,994
Taxicabs	499	79.8	39,820.2	485
Buses	148	200.0	29,600.0	7,890
Street car trains (800 cars)	637	356.0	284,800.0	47,062
Total	1,447	.....	354,220.2	55,437
Grand total	12,277	.....	1,201,126.2	75,431

The passenger automobiles carried 24.24 per cent and occupied 823,367.8 sq.ft.
The buses carried 10.46 per cent and occupied.............. 29,600.0 sq.ft.
The street car trains carried 62.39 per cent and occupied..... 284,800.0 sq.ft.
The percentage of space occupied by automobiles.................... 72.37
The percentage of space occupied by buses.......................... 2.60
The percentage of space occupied by street car trains................ 25.03

Now, let's do some "supposing!"

Suppose we assume that all the people carried had been carried in either taxis, buses or street cars.

How Much Space Would Have Been Occupied?

Kind	No. of Vehicles	Average Area Sq. Foot	Total Area Sq. Foot	Passengers Carried
Taxicabs	499	79.8	39,820.2	485
Buses	180	200.0	36,000.0	10,761
Street cars (827 trains)	983	356.0	349,948.0	64,185
Total	1,662	.....	425,768.2	75,431

A saving of area of 775,358 *sq.ft. or* 64½ *per cent.*

You may say, "Well, what of it?" or, you may say, "Figures don't lie, but liars will figure."

Did you notice the article in the daily papers of April 10, 1925, in which it was suggested that Woodward, Michigan and Grand River Avenues be widened to the tune of $100,000,000?

Suppose the cost was only a half or a quarter of that amount?

Who is going to put up the money?

Suppose the merchants along those streets put up the money, who bears the cost ultimately?

We all do—taxpayer and rent payer alike!!

Let's make another supposition!

Suppose we say the difficulty lies in the space occupied by private automobiles either parked, or in motion, and suppose we say the private owner uses his car in his daily business because he wants rapid transit? Suppose we say the problem will be solved if we can induce the private automobile owner to leave his car home by providing him with a service just as good or even better than that given by his own car?

As a means of doing this, your attention is directed to a copy of article entitled "Four Track Operation in Providence" which appears on pages 411 and 412 of the ELECTRIC RAILWAY JOURNAL for March 15, 1924, a photostated copy of this article being sent herewith.

The principal points of this article are:

The Railway Company instituted bus service parallel to its rail line service, and carried the local passengers in buses and the through passengers in express trolley cars.

The result was a reduction of running time from fifteen to ten minutes over a distance of 1¾ miles and more passengers are being carried by cars and buses than were formerly carried by the cars alone.

We would be glad to receive your comments on applying this scheme to our system. H. M. GOULD.
Assistant General Manager.

April 22, 1925.

SUMMARY OF PRINCIPLES

A recapitulation of the position being taken by the department is given by Mr. Gould also in a letter recently sent to the Associated Technical Societies of Detroit and published in its April bulletin. In this communication Mr. Gould referred to the data which appeared in the two "Economics Thoughts" mentioned and also to a paper on "The Influence of the Automobile on Regional Transportation Planning" in the April, 1925, *Proceedings* of the American Society of Civil Engineers. He then sums up the governing principles as follows:

1. Co-ordinated bus and rail line service has already been tried out with a resulting decrease in the time required to journey between two given points, and with it an increase in the number of passengers carried.

2. A check on the articles in the technical and daily press shows that the downtown traffic congestion is agitating public officials, railway executives and others in many cities, not only in the United States but in other places throughout the world.

3. The quotations as hereinbefore given, from articles written or speeches made by street railway men, an automobile manufacturer, an ex-street railway commissioner, a manufacturer of electrical equipment, a consulting engineer, the president of the American Automobile Association, a commission appointed to investigate railways, etc., are of the opinion that the bus has a place in the general transportation scheme and none of them is inclined to the belief that trolley cars are obsolete.

4. The traffic congestion is brought about primarily by the use of the private automobile, and the question arises as to what can be done to induce the automobile owner to leave his car home and use other vehicles having more economical street space requirements. If this is not done, the money required for street widening to provide storage for these automobiles will be all out of proportion to the benefits derived.

5. If there is inaugurated a bus service supplementary to the rail lines and incorporating therein the comforts (plus added convenience due to lack of necessity for finding parking space) of the private car, will or will not the owner of said car leave it home and thereby help to reduce the traffic congestion?

trification, in the opinion of Mr. Markham, is "what is best shall be done."

Robert Cary, general counsel of the New York Central Railroad, pointed out that the ideal development of transportation systems in the United States perhaps meant the substitution of electric for steam locomotives, but that the problem now confronting the railroad was not an ideal one, but a concrete one. He pointed out the criticisms that could be made on any generalization and stated it was necessary to recognize the actual problem confronting the railroad and the actual conditions under which they could develop. In the present situation the transportation companies are living from hand to mouth and not earning much. When a railroad man is confronted with the problem of electrification he finds he has no money and has no place to get it. This has a great bearing on any story told him about the future electrification and the future earnings, as he must persuade his directors on the basis of present conditions. The railroad man also doubts, when peak loads or business fall off and stagnation periods occur in transportation, whether the electrified system will permit the same economies with service curtailed as are obtainable with steam equipment. He pointed out that the possibilities of electrification seemed to be much brighter now in that railroad men are not specialists in particular systems of electrification and the present plan to have the specialists agree among themselves and then tell the railroad people the consensus of opinion as to the best system to be used on a particular system or part of a system was the only logical approach to electrification. He urged that the true principle of electrification be applied to particular problems and then that the concrete solution be made on the basis of the best possible compromises.

COMING MEETINGS

OF

Electric Railway and Allied Associations

***May 25-26*—Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.**

***May 25-28*—National Association of Purchasing Agents, Milwaukee, Wis.**

***May 27-28*—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.**

***May 28*—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass.**

***June 2-4*—Central Electric Railway Association, French Lick Springs, Ind.**

***June 3*—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

***June 3-5*—Iowa Electric Railway Association, Waterloo, Iowa.**

***June 10-12*—Canadian Electric Railway Association, Montreal, Quebec.**

***June 26-27*—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

***July 22-25*—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

***Oct. 5-9*—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

C.E.R.A. Midsummer Meeting Program

PROBLEMS of increasing the business and improving service will be taken up at the midsummer meeting of the Central Electric Railway Association, which will be held June 2-4 at French Lick Springs Hotel, French Lick, Indiana. Following is the complete program for the meeting:

TUESDAY, JUNE 2, 9:30 A.M.

Meeting of Executive Committee.

2 P.M.

Business meeting.

"A Survey of the Traction Situation," by Lucius S. Storrs, managing director American Electric Railway Association.

"How to Increase Passenger Traffic Through Advertising," by Frank L. Blanchard, director of public relations Henry L. Doherty & Company.

"A Major Operation on the Interurbans," by John A. Beeler, consulting engineer, New York City.

Discussion, led by:

Robert I. Todd, president Terre Haute, Indianapolis & Eastern Traction Company; W. S. Rodger, general traffic manager Detroit United Lines; F. D. Norveil, general freight and passenger agent Union Traction Company of Indiana; T. H. Stoffel, special engineer Westinghouse Electric & Manufacturing Company.

WEDNESDAY, JUNE 3, 9:30 A.M.

"Trend of Practice with Reference to Railway Power Systems," by G. H. Kelsey, superintendent power Cleveland Southwestern Railway & Light Company.

"Automatic Substation Performance," by Charles H. Jones, electrical engineer Chicago, North Shore & Milwaukee Railroad.

"Four Years Experience in Automatic Substations and Results," by L. D. Bale, superintendent substations Cleveland Railway.

Discussion, led by:

Allan J. Smith, superintendent of power Cleveland Railway, Power & Light Company; C. C. Argabrite, electrical engineer Interstate Public Service Company.

2 P.M.

Central Electric Railway Master Mechanics' Association, business session.

Joint Meeting of Transportation and Traffic Officials, round-table discussion.

THURSDAY, JUNE 4, 9:30 A.M.

"New Developments in Car Design," by Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL.

"Problems of Car Construction and Reduction of Noise in Passenger Cars," by J. A. Creig, editor *Electric Traction.*

Discussion, led by:

G. L. Kippenberger, assistant general manager St. Louis Car Company; Thomas Elliott, vice-president Cincinnati Car Company.

"Getting the Community with You," by Thomas Fitzgerald, vice-president Pittsburgh Railways.

Dire Penalties for Bad Advertising*

BY LABERT ST. CLAIR

Director of Advertising American Electric Railway Association

BETTER advertising copy will be written in the United States only when we have stricter laws controlling the writing of it, and when we have judges who will enforce these laws impartially. The following acts should be made illegal and penalties imposed as indicated:

For trying to convince anyone that advertising is anything except common sense salesmanship on paper—life.

For writing on a subject which we do not fully understand and which we have been too lazy to investigate fully —twenty years.

For "yessing" the boss and putting out a piece of copy which we know is poor—nineteen years and eleven months.

For writing a piece of public utility copy which even Oswald, the squarehead who washes plates at the roadhouse, cannot understand—eighteen years.

For using the words "mass psychology" or "reaction" either publicly or privately—life minus one day.

For running the pictures of any of the bosses' children or infant near-relatives on any piece of printed matter—fourteen years.

For trying to create sympathy for any company, incorporating a whine in any piece of copy or trying to sell service by any means except on its merits—the dungeon.

For contributing 1 cent to any special edition or "puff" proposition—twelve years.

For issuing copy for the news columns which will not pass on its merits as news matter—eleven years.

For trying to convince anyone that his mimeographed letter with the name filled in is a personal communication—ten years at hard labor. Preferably that of reading the letter again and again.

For writing flowing sentences, sprinkled with semicolons, but concealing from the reader what we are talking about—the rock pile.

For writing about and picturing our plant machinery to the entire exclusion of our human machinery—the pillory.

For writing flat, verbless, tomato-can-label headlines—the straitjacket

While all of us are in jail, we might ably spend our time trying to boil down the Book of Proverbs and Gray's Elegy. Upon emerging, we will have a much better appreciation of the value of space.

---

*Abstract of an address made before Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Use of Buses in City Service*

By William W. Holden
Superintendent Traction Department, San Antonio Public Service Company, San Antonio, Tex.

SELECTION of the right type of bus to meet the service requirements is vitally important. Since double-deck buses are not practical in any but our largest cities, where shade trees are not a prohibitive factor, I will discuss only the single-deck bus here. Seating capacity is a factor that should be given especial thought, as the success or failure of bus operation may depend on this. Single-deck city buses range in capacity from twelve seats to 32 seats.

It is axiomatic that the largest possible unit should be the most economical as there are so many items of expense, such as platform labor and cleaning, that are very nearly the same for any size unit. The 29-passenger bus is apparently the largest size which can be easily maneuvered in traffic, and it is my opinion that this will prove the most popular and economic size. There is, however, a very large field for smaller buses to be used where there is not sufficient demand for service to fill large buses on a reasonably frequent headway. Appreciable savings can be made by using a unit with a seating capacity of about twenty. Units smaller than this are not likely to show much, if any, additional saving in operating expense.

Frequency of headway is certainly one of the most important features of any service so far as winning patronage is concerned. It seems to me that we have two distinct fields of service requirements; one where frequency is the determining factor and which can best be served by a twenty-passenger bus; and the other where capacity is of more importance and which requires the 29-passenger bus.

If we are to learn the possibilities of the use of buses, we must know exactly what it costs to operate them. Depreciation is an important part of this cost. In the case of street cars, whose life is comparatively long, the question of depreciation has never received all the consideration that it should, but since buses have such a comparatively short life, an allowance for depreciation has been immediately recognized as one of the necessary items in the cost of operation. There is not much uniformity in the basis on which depreciation is charged, but there is a very general acceptance of this as a proper charge against operation.

The easiest method of figuring depreciation is the time basis, and a larger number of companies are using this. The more logical method is the mileage basis, as the charge off is proportional to the use obtained from the bus and consequently more nearly proportional to its earnings. On a mileage basis, there are companies figuring their depreciation on an estimated life of 200,000 to 350,000 miles, and on the time basis from three to six years.

Of course the largest single item in the cost of bus operation is platform labor. This is proportional to the service obtained from the buses and therefore needs no especial consideration in accounting. Gasoline consumption is another large item that has the same characteristic. However, the cost of tires is one that causes considerable fluctuation in the amounts expended. Some confusion as to actual costs of operation may result except over long periods of time unless a fixed charge is made, proportional to the mileage. In order to make this item more uniform it is recommended that a tire renewal fund be created by charging each bus with a certain amount per mile operated and that purchases and repair of tires and tubes be made from this tire renewal fund.

Net earnings from bus operation required to pay a reasonable return on the money invested represent such a comparatively small amount of the gross earnings that slight variations in traffic may change a net to a loss. For this reason as soon as there is any surplus above actual operating expenses a contingency fund should be established. After this has been built up to some predetermined sum considered adequate, the balance above this may be safely used in paying dividends.

A sufficient rate of fare should be charged to make the bus operation pay for itself. It is notable that practically all successful city bus operation is on the basis of a higher fare than is charged on the street cars. A higher rate of fare is necessary because of greater operating cost, and because the bus is being operated in less settled areas. The popularity of the bus service makes it possible to get higher fares with public indorsement, and we should endeavor to make each step in transportation progress pay its own way rather than to saddle bus losses on other parts of the system.

---

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Meeting of the New England Street Railway Club

THE May meeting of the New England Street Railway Club will be held at Copley Plaza Hotel, Boston, on Thursday, May 28. The afternoon meeting, which will be called to order at 4 p.m., will be devoted to papers and a discussion on "Car Painting and Cleaning." Papers on this subject will be read by H. G. Noble, superintendent of the Everett shops, Boston Elevated Railway; O. B. Johnson, inspector of car cleaning of the same company, and H. T. Hurlock, engineer of equipment of the Eastern Massachusetts Street Railway.

At the evening meeting, after the usual dinner, the topic will be the scope and purpose of the work of the committee on management and operation of the American Electric Railway Association. This subject will be discussed by R. B. Stearns and Elton S. Wilde, regional directors of District No. 1, which includes New England and New York; by Frank B. Walker, a member of the committee; by G. C. Hecker and R. F. Carbutt, representatives of the American Electric Railway Association, and by others. There will also be an address by Henry H. Crane on "Business at Bat."

Buffe Talks on Motor Buses

AMONG the papers presented at a three-day meeting of the Missouri Public Utilities Association held at Joplin on May 7, 8 and 9, was a discussion of "Motor Buses" by F. G. Buffe, general manager Kansas City Railways.

Mr. Buffe predicted that the time was not far off when every city of any size would have regulated motor bus service. Buses are useful, he said, in thinly populated districts and they help in larger cities during the rush. They should be regulated by law as common carriers and the laws should be uniform because they furnish interstate transportation. In his opinion street railway men should cease to think in terms of street cars only. Transportation is a business which covers many fields and in which many types of carrier and methods must be co-ordinated.

Metropolitan Traffic Problems

By Harland Bartholomew
Engineer City Plan Commission, St. Louis, Mo.

HANDLING of metropolitan traffic is today a serious problem, due principally to three phases of growth. First is the unprecedented development of mechanical transportation; second, the growing load on the street system; and third, the failure to appreciate the proper relationship between the street space and the rights of adjoining property.

Traffic regulation has not proved a solution of the problem, since it makes possible greater concentration of traffic and accentuation of conditions it tries to relieve.

The three basic factors to be considered in the solution of metropolitan traffic problems are: (1) unbalanced growth; (2) street design; (3) traffic regulations.

Unbalanced growth in the form of closely-grouped buildings of excessive height, and to numerous crowd-producing businesses such as theaters, hotels and department stores, completely upset the most elaborate systems of traffic control and the most perfectly designed street systems.

Every city should approach its traffic problems by first adopting and enforcing a regional and city planning scheme providing for complete industrial, commercial and social organization of its entire area. Traffic congestion occurs in very limited spots in every city. Rigid limitation of building heights and a reasonable spreading of crowd-producing businesses in congested centers are the fundamental steps in solving the metropolitan traffic problem. Higher and higher buildings and ever greater concentration of business are not so much monuments of business enterprises as they are symptoms of economic waste. Witness New York's $500,000,000 expenditure for subways, with congestion greater today than ever before. The "congestion tax" of New York is estimated at $1,000,000 per day, of Chicago $600,000. We have scarcely begun to explore the field of relation of street space to building content and use.

---

*Abstract of a paper before annual meeting Chamber of Commerce of the United States, Washington, D. C., May 20-22, 1925.

The second step in meeting the metropolitan traffic problem is by the design of an adequate street system throughout the present and future area of the city and its region. Elements in the design of an adequate street system are:

By-pass routes for traffic that neither originates nor terminates within the region.

A gridiron of wide streets comprising the various traffic centers of the city and region.

A series of wide streets connecting each of the important centers of the region.

By-pass streets around each center.

Parallel streets or roadways for separation of the three distinctive types of traffic—auto trucks, street cars and buses, and passenger automobiles.

Separation of street grades where great streams of traffic cross.

Provision of well-designed pavements on all major streets.

Elimination of jogs, dead ends and abrupt curves within traffic centers and on the streets comprising the main street structure.

Provision of not less than four lines of moving vehicles on each major street.

Widening the throat of particularly important intersections.

The ability of each city to design a completely satisfactory structure of major streets as outlined will depend upon its physical configuration, existing improvements, and its legal and financial resources. Such a plan, once prepared, will gradually be susceptible of execution through united co-operation of public and private effort. Wasteful, piecemeal and haphazard improvements producing no adequate returns will thereby be prevented.

Traffic regulation, the third and final step in meeting the metropolitan traffic problem, should always be devised in accordance with known traffic movements. Constant traffic counts will disclose the tendencies of traffic flow. Regulation should facilitate natural flow. Rigid and arbitrary traffic regulation unrelated to street design and natural flow may be more harmful than a certain degree of congestion.

Universal application of any one type of regulation or device is questionable and usually unwise. Depending upon conditions, certain regulations may be of value, as follows:

Synchronized or platoon movement upon heavily-used thoroughfares of great length.

"Boulevard stops" upon all major streets not under direct control.

Elimination of parking on all streets, or on important "through" streets in traffic centers during rush hours.

Limitation of parking (one hour or less) in traffic centers.

Segregation of traffic according to type.

One-way streets (more necessary on streets of restricted width).

Confinement of trucking to night hours in traffic centers, especially where no alleys exist.

Restriction of unnecessary traffic movement.

Pedestrian movement only with traffic when under control in traffic centers.

Attention should be given by all cities to the particularly valuable set of conclusions and recommendations of the recent Hoover Conference on Street and Highway Safety, especially that of a centralized authority having full responsibility in matters of traffic study, design and control.

U. S. Chamber of Commerce Considers Transportation

Motor Vehicle Transportation, City Planning and Housing Discussed—Many Other Subjects of General Interest to Electric Railway Men—New Home of Chamber in Washington Dedicated

OF CHIEF importance to electric railway men among the various sessions was the meeting of the Transportation and Communication Group held May 21. Following a brief discussion of improvement in the steam railroad situation by Carl R. Gray, president Union Pacific System, and the problems of the merchant marine, presented by A. J. Brosseau, president Mack Trucks, Inc., the regulation of common carriers was considered.

Judge John E. Benton, general solicitor National Association of Railroad and Utility Commissioners, discussed the motor vehicle problem. The present investment in motor vehicles and necessary auxiliaries, he said, is now greater than that in the steam railroads.

The use of motor vehicles for hire affects the public from the standpoints of safety, and of convenience to other users of the highway. There is a tendency to multiply such vehicles beyond the needs of the public. Certain of them are now carrying passengers and goods at less than cost, on account of the free use of the highways granted them.

The motor vehicle has come to stay, said the speaker. Its cost to the public in an indirect way must be considered as well as its effect on other established carriers. The private automobile has attracted so much traffic from the electric railways that some of them find it difficult to operate. Further encroachment will make problematical the continuance of many essential electric railways, and also of some of the steam railroads.

Evidently there should be some regulation to keep within bounds the number of vehicles that operate on the highways. Common carriers now are required to obtain certificates of convenience and necessity or licenses from state authorities. In the past the same principle has been applied to interstate business. On the whole, it has been quite satisfactory. The recent decision of the United States Supreme Court, however, has laid down the principle that regulation of carriers engaging in interstate business is beyond the regulatory powers of the states. This has thrown open the interstate business to all comers.

We cannot continue to be half slave and half free in this, as in any other matter. The problem is not whether the situation will be met but how it will be met. The legal questions involved are not difficult. The only point is whether the authority will be lodged in one central bureau, in Washington, or in the local communities.

T. R. Dahl, vice-president the White Company, did not subscribe to the statement given by the previous speaker of the present situation. Motor vehicles have paid for 42 per cent of the cost of the highways, he said. The motor vehicle industry has co-operated with the American Electric Railway Association and has worked out a code of principles for co-ordinating the services. If the electric railways can handle traffic at less cost by motor vehicles they have the opportunity to do so and are doing it.

The industry was getting along nicely until the recent Supreme Court decision, in the opinion of the speaker. No one is more concerned as to the outcome than the motor vehicle operators. Regulation means protection against unfair competition. It seems to the speaker that regulation of this business is a local problem, as the control should be given where the service is rendered. Interstate motor vehicle operation rarely extends into more than two states. Congress should pass a law empowering the Interstate Commerce Commission to grant certificates of convenience and necessity as a matter of form where the states concerned have already granted such certificates. Thus the commission can act as an arbiter in smoothing out differences.

A paper on metropolitan traffic problems read by Harland Bartholomew, engineer City Plan Commission of St. Louis, is abstracted elsewhere.

BUS MEN PRESENT RESOLUTIONS

Following a two-day session of motor vehicle operators at which an agreement was reached on principles of legislation for the regulation of motor vehicle common carriers engaged in interstate commerce, a resolution was adopted stating these principles. This was received by the group meeting of the Chamber of Commerce as a communication. It follows in full:

> Congress should enact legislation giving the Interstate Commerce Commission the power to grant or refuse certificates of public convenience and necessity to motor carriers engaged in interstate commerce. In view of the fact that the Interstate Commerce Commission is already burdened with all it can handle and because of the fact that states through which such motor vehicle lines operate are primarily interested in such operations, the authority of the Interstate Commerce Commission should be limited to the granting or refusal of certificates.
>
> Certificates shall be granted as a matter of form in all cases in which the application for a certificate is accompanied by certificates from the State Public Utilities Commissions of the various states through which the motor vehicle line is to operate, certifying that such lines will serve the public convenience and necessity; provided lines operating in good faith on March 3, 1925, shall be presumed to be necessary to public convenience and necessity and such lines in the absence of evidence overcoming such presumption shall receive a certificate

for routes established by them. (The term State Public Utilities Commission comprehends state authorities regulating public utilities regardless of by what name called. In states where there is no public utility regulation of motor vehicles common carriers the State Highway Commissioner may issue such certificate.)

In cases where such certificates from a state Public Utility Commission cannot be obtained by the applicant the Interstate Commerce Commission shall grant a hearing on the application for a certificate in order to determine whether such operation is a matter of public convenience and necessity. In determining that fact the commission shall take into consideration existing motor transportation facilities. In all other questions involving certificates the Interstate Commerce Commission shall act as an arbiter in determining differences of opinion between the Public Utilities Commissions of the states through which such lines operate. All other regulation of operation of interstate motor vehicle common carriers shall be exercised by the Public Utilities Commissions of the states in which the operation is carried on.

The above embodies the fundamental principles of such proposed legislation and a bill shall be drafted embodying such principles and such details as will be reasonable and just having due regard to the convenience and safety of the public and the proper protection of motor carriers.

PRESIDENT GRANT URGES STABILITY

In urging the nation to continue to build on what it has rather than to experiment with other types of construction, Robert F. Grant, the president of the chamber, pointed out in his annual address at the Wednesday morning session that "in the last election one-seventh of the votes cast were for a platform which favored public ownership of the nation's water power; retention of surtaxes on large incomes; restoration of taxes on excess profits and on stock dividends; progressive taxes on large estates and inheritances; reconstruction of the federal reserve and farm loan system to provide for direct public control of the nation's money and credit; creation of a government-operated marketing corporation; protection and aid of co-operative enterprises by government and state aid legislation; repeal of the Esch-Cummings law; public ownership of railroads; curtailing the power of the courts, and the election of all federal judges for limited terms. More than 4,600,000 voted for this platform."

Because of this situation Mr. Grant urged that the Chamber of Commerce continue its process of educating the American public in basic economics and of American business to govern itself.

A domestic development regarded as of encouraging and far-reaching import was the announcement by Hon. W. E. Humphrey, Federal Trade Commissioner, of a new creed by the Federal Trade Commission. It reads:

> We do not believe that success is a crime.
>
> We do not believe that failure is a virtue.
>
> We do not believe that wealth is presumptively wrong.
>
> We do not believe that poverty is presumptively right.
>
> We do not believe that industry, economy, honesty and brains should be penalized.
>
> We do not believe that incompetency, extravagance, idleness and inefficiency should be glorified.
>
> We do not believe that big business and crooked business are synonymous. (True, we will give closer scrutiny to big business than to small business, because of its greater power for good or evil.)
>
> We believe that 90 per cent of American business is honest.
>
> We believe that 90 per cent of American business is anxious to obey the law.
>
> We want to help this 90 per cent of honesty.
>
> We want to control or destroy the 10 per cent that is crooked.

The significance of this change of attitude was recognized as going deeper than the activities of the Federal Trade Commission. The appointive power of the administration was used in such a way as to bring about this change of policy, which is taken to mean that the creed really sets forth the administration's attitude toward business.

NEW BUILDING DEDICATED

Chief Justice Taft, former President of the United States, paid a notable tribute to the American business man in the course of remarks at the dedication of the new building of the Chamber of Commerce, Wednesday evening.

In commenting on the need for an intelligent public opinion, the Chief Justice declared that one of the difficulties in bringing public opinion to bear upon the direction of government is the "lethargy of the ordinary citizen and his indisposition to develop an interest in important general questions." He commended the Chamber of Commerce for its efforts in arousing the citizen "to a sense of responsibility in a quasi-judicial self-examination of his own views, and by comparison with the views of his fellows brings about definite conclusions out of a nebulous, lazy, ignorant condition of mind that so often persists, even among the intelligent but indifferent."

On Thursday evening the principal speaker was Secretary of Commerce Herbert Hoover, who addressed the meeting on the subject of "Waste in Government." His paper is abstracted elsewhere.

Waste in Government*

BY HERBERT HOOVER
Secretary of Commerce

FROM time to time I have had a good deal of co-operation with business in the elimination of waste by better organization in our economic system. Tonight it seems fair that I should take the part of a business man and talk about our governmental organization and the great wastes that result. Bad co-ordination among industries finally comes home to the people as a whole in the form of increased prices. And bad organization in government comes home in many more directions than even the taxes it wastes.

Over many years our people have been striving to better the federal administration. We have succeeded in two major steps; we still have a third equally important and perhaps more difficult one to accomplish. The first was the establishment of government employment based upon merit. The second was the establishment of adequate control of appropriations through the budget system. There still remains the third and even greater but more obscure waste—that of faulty organization of administrative functions. And the two first steps will never reach the full realization without the third.

When Hamilton laid out the scheme of executive departments he placed the different functions of administration as nearly as might be into groups of the same general major purpose under single-headed responsibility. But ever since his time we have been busy dividing responsibility by scattering services directed to substantially the same major purpose over many different executive departments and bureaus. Our governmental machinery has just grown. On the executive side of the federal government we have grown to have more than 200 different bureaus, boards and commissions, employing several hundred thousand people. For the most part they have been thrown hodge-podge into ten different executive departments, under Cabinet officers. But there are more than 40 independent establishments either directly under the President or under Congress.

As this immense number of bureaus and agencies is now grouped and organized there are six primary streams of confusion and waste. There is a confusion of basic principles; there is a grouping of federal bureaus which divides responsibility; there arises from this scattering a lack of definite national policies; direct wastes arise from overlap and conflict; indirectly large costs are imposed upon citizens by this scattering of functions and by the undue complexity of laws and regulations. There is not a single successful business organization in the country that confuses such functions the way we do in government.

	Bureaus or Agencies	Departments or Independent Agencies
Public works construction	14	9
Conservation of national resources	8	5
Direct aids to industry	5	2
Direct aids to merchant marine	14	6
Direct aids to education	6	3
Direct aids to veterans	4	4
Government of territories and dependencies	4	3
Public health	4	2
Purchase of $250,000,000 of supplies annually	In every bureau of the government	

DIVISION OF AUTHORITY IN ADMINISTRATIVE AGENCIES

Our other greatest weakness in organization is the division of authority over services directed to the same major purpose by scattering them through unrelated groups. Needless to say, some of the ten executive departments are fairly homogeneously devoted to a particular major purpose—notably the Department of Justice, the Navy Department, the State Department, the Department of Agriculture and the Post Office Department. But all the others, and even some of these, contain functions that should be transferred elsewhere. And there is hardly a department that should not, when it gives up those functions which are without relation to its major purpose, receive in exchange functions which properly belong in its jurisdiction but which are now performed by other departments.

---

*Abstract of an address before the annual meeting of the Chamber of Commerce of the United States, May 21, 1925.

To illustrate my point, I have made a partial collection of misfits, and in so doing I have taken no account of either incidental functions or semi-legislative or semi-judicial agencies except so far as they have administrative functions.

It is not necessary that each of these groups should become a whole executive department, each under a Cabinet officer, but it is entirely feasible to place each of them under the supervision of a special assistant Secretary, and if we were truly intelligent we would class him as an expert and outside selection on political grounds. It is entirely secondary what department these groups are in. The big thing is to bring these kindred agencies together under one authority so that their overlapping edges can be clipped.

The divided responsibility with absence of centralized authority prevents the constructive and consistent development of broad, national policies, for there is by necessity in this division constant conflict of view within the government itself.

The forty governmental agencies which are now supposed to function directly under the President present another problem. It is preposterous to expect that with his multitude of higher obligations the President can give them anything like adequate supervision. As a matter of fact, these independent establishments conduct their activities with very little supervision or co-ordination. The last group, the straight administrative functions, expend nearly half a billion a year—as much as the total of five of the departments under Cabinet officers.

CENTRALIZATION OF GOVERNMENT

No one doubts that for many years there has been a steady tide of federal encroachments into state authority, and beyond this a steady thrust of the arm of federal government into our private business. They are now so securely intrenched as to make decentralization a very difficult job.

But if we examined these encroachments we would find some considerable part of it takes root in the very lack of organization in our federal government. There is an impelling urge in most of these agencies which pushes them on to extend some fraction of their functions into all sorts of activities which the federal government should leave to other quarters.

There is one side of the federal government that is certainly not sufficiently expanded today—that is scientific and economic research and the promotion of public interest by voluntary co-operation with the community at large. This is never an encroachment upon the rights of individuals. It can truly be better organized, but today the whole of our activities in these directions involve less than 3 per cent of our federal budget, and they bring returns to the taxpayer not in few per cent but in hundreds of per cent every year.

What we need is three primary reforms; first to group together all agencies having the same predominant major purpose under the same administrative supervision; second, to separate the semi-judicial and the semi-legislative and advisory functions from the administrative functions, placing the former under joint minds, the latter under single responsibility, and, third, we should relieve the President of a vast amount of direct administrative labor.

Nor will we ever attain this until Congress will authorize the President or some board, if you will, or a committee of its own members to take the time to do it. Congress courageously removed the civil service from politics; it created the budget, it established the classification. The remaining great step is to authorize the reorganization of the administrative arm of the government.

American Association News

Equipment

NUMEROUS specifications were considered at a meeting of the equipment committee of the Engineering Association held at association headquarters, New York City, May 14 and 15. Members present were: P. V. C. See, chairman; Daniel Durie, sponsor; W. W. Brown, R. S. Bull, A. T. Clark, L. H. Fry, J. L. Gould, J. M. Hipple, J. C. McCune, A. D. McWhorter, E. S. Sawtelle, R. B. Smythe, C. W. Squier, H. S. Sweet and H. S. Williams. Others present, not members of the equipment committee, were G. L. Schermerhorn, who represented E. D. Priest; C. A. Alden, E. M. T. Ryder, and R. C. Cram, who represented the way committee; J. S. McWhirter and W. H. Phillips.

The various subjects to be recommended for consideration by the ensuing committee were gone over. Many of the subjects which were considered this year are to be continued. Much work has been done in reviewing and bringing up to date the existing standards and specifications. The standards and specifications on which changes are to be reported include: Journal boxes and contained parts, design of axles, limit of wear gages for standard contours, plain gage for solid steel wheels, wheel mounting and check gages, gages for journal bearings and wedges, and specifications for gears.

The committee recommended that the specifications for open-hearth hammered steel axles be withdrawn. New limit of wear gages have been prepared for standard A.R.A. contours. These are the same as the A.R.A. gages. The wheel mounting gage has been revised to correspond to the new wheel contours, and a new wheel checking gage is being submitted. Combined gages for journal bearings and for wedges are to be submitted. These have the same general form as the combined gage used by the A.R.A.

Replies to an exhaustive questionnaire on boring gears and the desirability of specifying machining tolerances were gone over. It was decided that machining tolerances should be incorporated in the specifications for gears and the various allowances were decided upon. The miscellaneous methods and practices on armature and axle bearings are to be resubmitted with a revision of the table on clearances and tolerances for bore of armature bearings.

A comprehensive report by the sub-committee on design of hand brake equipment and foundation brake rigging was presented, with the recommendation that this be included in the miscellaneous methods and practices.

An analysis of replies to a questionnaire on methods of car painting was presented. The general trend indicated is toward spending less time for complete painting operations. Information received regarding the cellulose-lacquer system indicates that many companies are experimenting with this to determine its durability as compared with previous systems. Due to the short time that this system has been used by electric railways, no definite results were obtained.

The sub-committee which has been considering motor coach design in co-operation with a special committee of the Society of Automotive Engineers reported substantial progress. Proposals were made for tentative types of motor coaches for adoption as standards, together with specifications for guidance of those using motor coaches. Little progress has been made in the consideration of trolley contact devices by the sub-committee this year. An attempt will be made, however, to obtain some additional information and results of tests which various railways have been conducting, for inclusion in the committee's report.

An analysis of replies received to a questionnaire on gearing was presented. The information received this year has led to more definite conclusions than that received in previous years. This subject has been considered by equipment committees for the past four years.

Much work has been done by the sub-committee studying methods of reducing noise in car operation. A report will be presented as to work which has been done and which could be done to advantage for reducing car noise. The committee feels that the subject should be continued and that future work should be directed toward a more scientific study of car noises, including the conduct of tests and research work.

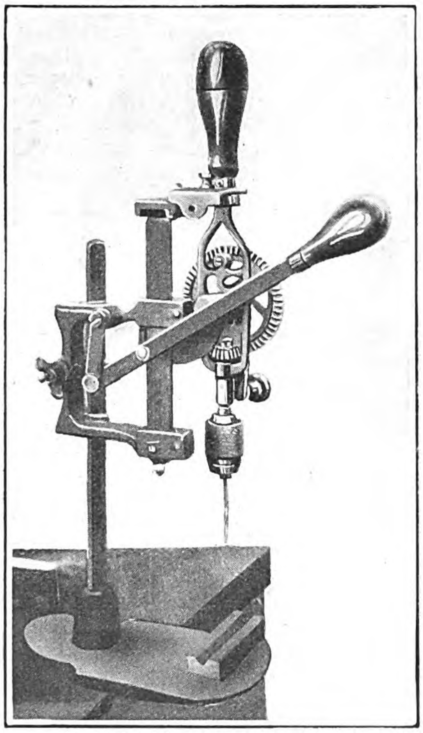
Association Publications Listed

CLASSIFIED according to subjects, all the current reports of the Bureau of Information and Service are listed in a compilation just sent out from association headquarters. The period covered in the list is from April 1, 1924, to April 1, 1925. Some 40 bulletins are included. These are available to member companies and may be obtained by application to association headquarters, 292 Madison Avenue, New York City.

Maintenance of Equipment

Convenient Mounting for Hand Drill

WHERE many small parts are to be drilled at a bench, work can be done much faster and with less inconvenience to the workmen if a drilling fixture is used for supporting the hand drill. The accompanying illustration shows a fixture used in the 65th Street shops of the Third Avenue Railway, New York. In this case the hand drill is used for drilling small holes in various parts which must be assembled on the bench and which otherwise would require the workman going a considerable distance to the drill press in order to finish the operation after the holes are laid out.


Fixture for Holding Hand Drill for Bench Work

The fixture consists of a base with uprights for supporting the attachment to the hand drill and also a V block for centering the work accurately underneath the drill. The fixture is arranged to slide up and down on the upright support so that the drill can be located conveniently for different sized work. The hand drill is clamped to a movable arm with two clamps, and this arm is arranged to slide up and down in two guides. Movement of the sliding arm is provided by a lever with wooden handle at the end. The fulcrum of the lever is at the back of the attachment about 4 in. toward the handle end. A swing link is provided for the fulcrum, so that the movement of the slide up and down will be vertical, and any binding action which otherwise might result if a slotted arm were used is avoided. This lever arrangement gives added pressure to what would be obtained with the ordinary use of a hand drill, and the convenient method of operating makes drilling easy and also insures accurate workmanship.

Good Record of Cars Pulled In

COMPARATIVE statements for cars pulled in and maintenance costs for the properties comprising the Electric Railway Association of Equipment Men, Southern Properties, have just been issued. These give figures for car pull-ins for the twelve Southern cities in this association for the month of April and for the year to date. Comparative maintenance costs per 1,000 car-miles are given for March.

CAR PULL-INS CHARGEABLE TO CAR-HOUSES OF SOUTHERN PROPERTIES FOR APRIL, 1925

Railway	Average Miles per Pull-In	Railway	Average Miles per Pull-In
New Orleans	181,021	Little Rock	14,683
Nashville	91,787	Birmingham	14,605
Knoxville	37,734	Texas Electric	13,734
Covington, Ky.	31,282	Mobile	12,331
Memphis	18,265	Dallas	9,963
Atlanta	17,717	Chattanooga	4,720

The lowest total maintenance cost for the month was made at Little Rock. Figures for the various accounts for March and for the year to date as compared with the same period during 1924 are given in an accompanying table.

Another table gives the average miles per pull-in for the month of April for the various cities. The list of troubles which have caused most frequent pull-ins shows that these include armatures, brushes, brush yokes and brush-holders, fields, controllers, rheostats, brakes and brake rigging.

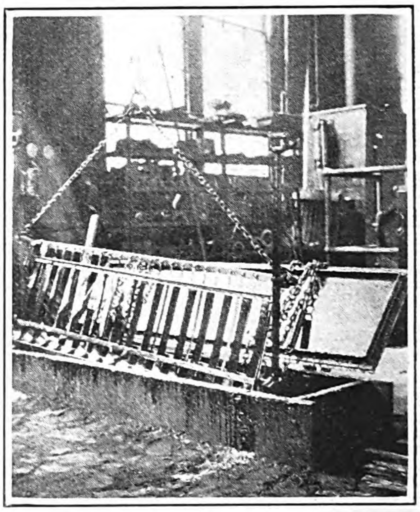
MAINTENANCE COST IN CENTS PER 1,000 CAR-MILES

FOR CARS AND EQUIPMENT IN LITTLE ROCK FOR MONTH OF MARCH, 1925, AND FOR YEAR TO DATE COMPARED WITH SAME PERIOD OF PREVIOUS YEAR

Account	1925 March	1925 Year to date	1924 March	1924 Year to date
Superintendence of equipment	1.79	1.90	1.91	1.92
Passenger and combination cars	5.59	10.26	10.43	13.47
Service equipment	.09	.12	.39	.38
Electrical equipment of cars	4.46	5.10	6.81	7.21
Shop equipment and tools	.56	.38	.52	.24
Shop expenses	.99	1.06	.98	1.73
Total maintenance	**17.48**	**18.82**	**20.84**	**24.95**

Dipping Tank Speeds Up Fender Painting

IN THE Homewood shops of the Pittsburgh Railways a dipping tank has recently been installed to facilitate the painting of certain classes of material. Any small part to be painted black is dipped in this tank. Its primary use, however, is for fenders.


Counterweight Holds Fender Suspended About the Dipping Tank

Doing fender painting by hand, a skilled man could do about two per hour. By dipping a speed of about 24 per hour can be obtained when necessary, although this is not desired under ordinary circumstances.

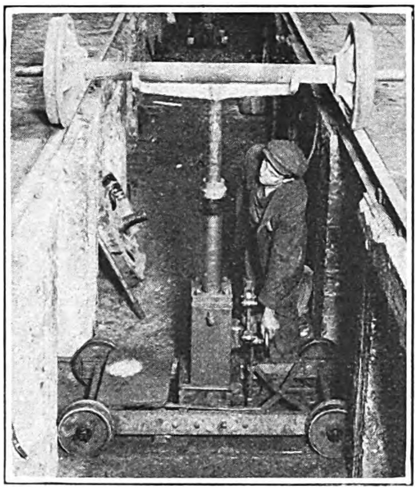
The dimensions of the tank are approximately as follows: Length, 6 ft., width 20 in., depth 5 ft. Its location is in the blacksmith shop alongside the bench where the fenders are repaired. A pulley has been arranged with a counterweight equal to the weight of a fender. The latter is hooked on to the pulley, dropped down into the paint tank, then raised and allowed to drip for an hour. Repairs to a fender take about an hour on the average, and the next can thus be repaired while one fender is dripping.

Handy Attachments for Pit Jacks

WHERE pit jacks are used for handling underbody equipment, wheels, motors, etc., special arms and tops save time and labor and also make the handling operation much safer for workmen. The accompanying illustrations show two special top fixtures as used in the 155th Street shops of the Eighth Avenue Railroad, New York City, with Watson & Stillman jacks.

For handling wheels an upright extension is clamped to the top of the plunger. This has extension arms at the top with V-shaped notches into which an axle fits conveniently. The top arm is 3 ft. broad, permitting the axles to be supported at a sufficient distance from the center, so that danger of tipping and dropping is avoided. In handling armatures, a steel plate with felt pad is arranged to fit on top of the hoist plunger. This provides a convenient support for armatures and at the same time insures them against damage.

Handling an Armature with a Pit Hoist and Special Padded Plate.



An Extension Arm Fitted to the Top Plunger of the Hoist Insures Safety in Handling Wheels

Softening Fiber for Convenient Working

IN MAKING fiber washers for the end insulation of governor coils in the shops of the New York & Queens County Railway, it has been found necessary to soften the fiber for convenient working. The washers are cut from $\frac{3}{16}$ in. fiber by using a special extension bit, with two cutting extensions, one to cut the outside while the other makes the hole. Where fiber is used in its usual form, it is so hard that continual sharpening of the bit is necessary and as a result accurate work is made difficult.

The practice followed in the Woodside shops of the New York & Queens County Railway is to soak a sheet of fiber in water until it is soft. The washers can then be cut out very easily. These are then dried under pressure by assembling a quantity of washers on a bolt with steel washers at either end. One washer is placed under the head of the bolt and another washer underneath the nut. By tightening down on the nut sufficient pressure is obtained to squeeze out water and the assembled washers are then dried out in a baking oven. The nut on the end of the bolt is screwed down several times as the washers are dried out. This method insures that the washers are perfectly flat when finished and the pressure which is put on them makes them very hard.

Double Boiler Used for Heating Pinions

CARE is taken in the installation of pinions at the Utica Park shops of the New York State Railways to make certain that they are well seated and that no damage results to the shaft or pinion bore while they are being put on. Prior to being installed all pinions are heated for fifteen minutes in boiling oil at a temperature of about 212 deg. F. When heated the pinions are taken out and installed quickly before they have a chance to cool. The pinion is tapped into position with a heavy piece of wood held between the pinion and the hammer, not to get a driving fit but to be sure that the pinion is well seated. The pinion nut with its lock washer can then be screwed tight. The oil which is retained prevents rusting.

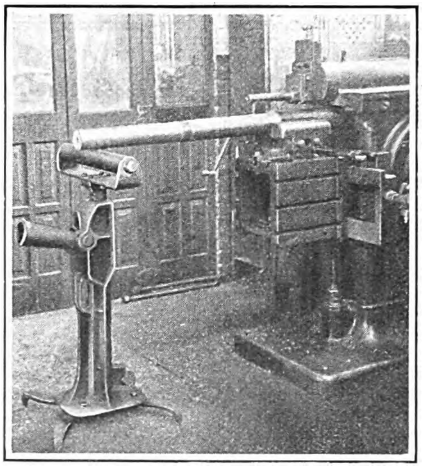
The accompanying illustration shows the type of heater used, which is essentially a double boiler made of sheet steel. The inner portion has handles so that it can be lifted out. The outside casing is 2 ft. x 2 ft. 6 in. x 2 ft. high. Four electric heating coils are installed at the bottom between the two cases. These are in circuit on the 550-volt shop circuit. The resistance tubes are installed on a cradle, which keeps them free from touching either the bottom or the upper container. A cradle inside the inner section keeps the pinions from touching the bottom or sides while heating. Ordinary machine oil is used and the amount is just sufficient to cover the pinion thoroughly. The hinged cover can be closed down and all heat retained.

Double Boiler Used to Heat Pinions in Oil at Utica Park Shops

Roller Top for Jack

For drilling long plates on a drill press or machining long parts in a shaper, it is necessary to have some form of rest for the end of the material that is not supported by the shop tool. Frequently, the work requires moving back and forth for various operations. A support with a roller and adjustable for height has been found particularly convenient in the Utica Park shops of the New York State Railways, Utica Lines. The illustration shows how a roller top and a special base to prevent slipping have been attached to a Simplex jack in the shop. The roller top is arranged to bolt directly to the standard head of the jack. The roller has a diameter of 2½ in. and is about 2 ft. long. A flat plate bent at the end serves for the bearings of the roller, and for bolting to the jack.

In order to prevent slipping on the floor, a base having four legs with sharp points is bolted directly to the base of the jack. When once placed in position the support cannot be shifted by the pressure of the work on the roller.



Jacks Provided with Roller Top and Pointed Feet for Use in Supporting Long Material During Machining

New Equipment Available

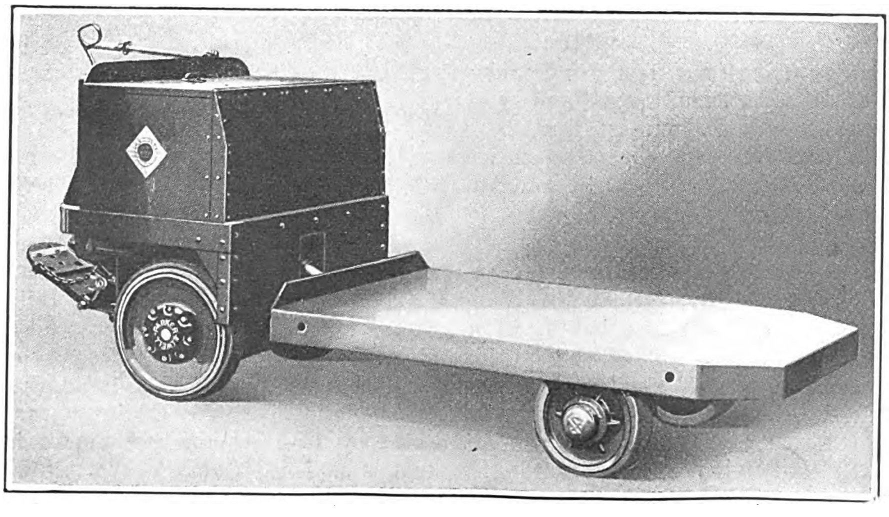
Electric Lift Trucks

A new design of electric lift truck, arranged particularly for use in electric railway storage yards, has been brought out by the Elwell-Parker Company, Cleveland, Ohio. This haulage unit is of 30-in. gage for both front and rear wheels, which is broader gage than the types designed particularly for inside operation. The driving wheels are 22 in. and the front wheels 15 in. in diameter, and either 3½ or 4-in. tread can be furnished. Drive wheels are fitted with a double row of ball bearings, weighing 13 lb. each. Radial thrust bearings measuring 7 in. outside diameter are used.

The wheels are carried on drop forged knuckles with drop forged levers pressed upon tapered serrations. The knuckles support the weight of the axle, frame and load on a steel ball bearing recessed in a cup at the ends. Levers are fitted with ball ends to fit the steering rod sockets. All rods are placed high beneath the platform to avoid contact and interference with obstructions. Full floating alloy steel drive shafts are pressed into drop-forged clutch plates, which are bolted to the outside of the drive wheels. These shafts are fitted with chrome-vanadium universal joints and engage the splines of the differential.

The differential carries a special Brown & Sharpe phosphor bronze worm wheel. This is lock-bolted between the two halves of the drop forged differential cage. A multi-thread steel worm on radial and thrust bearings is assembled with the differential. A new type of universal joint inside the brake wheel connects the drive worm to the motor shaft. The motor has a demountable armature and is fitted with ball bearings.

The tractor platform is 40 in. wide and 72 in. long and is formed from a single steel plate with deep side flanges. The platform nose is tapered to aid its insertion beneath a skid even though approached from an angle. The lift of the platform is 6½ in. It is 1 in. high when in low position and 23½ in. when raised. This construction provides increased underneath clearances over other types, which is an important factor when traveling over rough surfaces, such as are common in storage yards.



New Type Electric Lift Tractor

Free-Handle Circuit Breakers

Non-closable on overload is a feature of a new type circuit breaker now being offered to the market by the Roller-Smith Company, New York, N. Y. Sturdiness and simplicity have received special attention. The non-closable on overload feature can be supplied on any of the standard type circuit breakers furnished by this company, irrespective of current voltage, style of trip, or number of poles.

In this new device a circuit breaker is provided which cannot be closed or held in on overload, even though the operator's hand is on the handle. This new design of free-handle circuit breaker differs from the regular plain overload breaker mainly in the construction of the handle lever and the tripping lever. The handle lever roller is mounted on a triangular casting pivoted to a shaft. A second member of the handle lever pivots to the first and carries a latch. On pulling down the handle in the usual manner, the roller functions to close the breaker in the ordinary way. If the latch moves backward, as occurs when the overload armature operates, the breaker will open, while the main part of the handle still remains in the down position.

The News of the Industry

Wage Agreement Renewed in New York State

The existing wage and working agreement between the New York State Railways and its employees in Rochester, Syracuse and Utica will remain in effect until May 1, 1926. This was determined on May 20 at a second referendum taken by members of the Rochester union, who previously had rejected renewal by a large majority. The second ballotting resulted, according to unofficial count, in a tie, 274 to 274, but under the system of pooling the votes of the three cities the margins given the renewal in Syracuse and Utica in the first pool hold over, insuring the continuation of the agreement by a majority of 276 votes. Only Rochester members took part in the second vote.

The present wage scale calls for a maximum of 55 cents an hour for two-man car operators, with 5 cents an hour additional for one-man car workers and 2 cents additional for the men on interurban lines.

During the conferences prior to the referendum James F. Hamilton, president of the New York State Railways, promised the union officials that he would co-operate with them in their efforts to induce all employees of the company to become affiliated with the union. He made it plain, however, that there would be no coercion on the part of the traction company toward this end.

Decline in Traffic Alarming in Cincinnati

Unless there is a betterment of business during the remainder of the year, as compared with the first three months, the Cincinnati Traction Company, Cincinnati, Ohio, will carry in 1925 about 95,000,000 passengers, instead of 103,000,000, the number figured in the company's budget. Based on a 10-cent fare this difference of 8,000,000 would mean $800,000 less revenue than had been estimated. The figures on file for the three months of this year compared with a similar period of last year show a decline of 2,139,599 revenue passengers. By months the figures are:

	1925	1924
January	8,436,794	8,967,180
February	7,677,361	8,549,249
March	8,295,326	9,032,651
Total	24,409,481	26,549,080

The causes of the decline are classified as follows: Industrial, including unemployment or part time, lower wages, high rents and consequent concentration of population in congested districts of cities; increased patronage and competition of buses; greater use of the individual and group-carrying automobile; the radio keeping thousands of persons in their homes who formerly went out for entertainment; the erection of movie theaters in smaller community centers in a city, thus permitting patrons to reach them on foot instead of using vehicular transit downtown and high street car fare.

It is the bus situation that is causing most concern. One expert in Cincinnati estimates that buses are now carrying daily 20,000 revenue passengers. Others do not estimate the number above 15,000 daily, but even these admit that the number of passengers being transported by bus is increasing.

Urban transportation experts, including the Technical Advisory Corporation, which some months ago rendered a report to the City Planning Commission, say Mount Washington, Silverton and Mount Healthy are entitled to transit and that it is the true rôle of the bus to render service to these and other similar places. Buses, they say, could operate from these localities to the present end of the railway and connect communities like Hartwell and Mount Healthy.

Urban Transit Must Be Centralized

Review by Head of Department of Detroit Railways Shows Autos Run for Hire Over Fixed Routes Handle 40,000,000 Passengers—Plea Made to Council for Definite Policy

Ross Schram, general manager of the Department of Street Railways at Detroit, Mich., says that to keep a low, universal fare, frequency of trade and a high riding habit, urban transportation must be centralized. In replying to a request from the Council to supply it with a general observation of the miscellaneous automotive transportation furnished in the city, he says that there are now operating in the Detroit district, either wholly or in part, more than 800 passenger-carrying buses. This includes 244 vehicles of the Detroit Motor Bus Company. Included in this total are approximately 150 buses owned and operated by individuals on spasmodic schedules and indefinite routes.

More that 925 jitneys operate in the same district. Mr. Schram says there is a very meager record of the ownership, operation and routing of both buses and jitneys other than those of the Detroit Motor Bus Company and two or three of the older and more stable interurban bus companies.

Not only is there a lack of records but also a lack of adequate supervision of this traffic as regards routes, schedules, law observance, liability and safety of equipment. Many of the buses which operate under state permits are doing a local business inside the city. At the present time the buses are said to be transporting passengers at a rate which will total between 35,000,000 and 40,000,000 people a year.

The jitneys are operating at the present time at a rate of approximately 8,000,000 to 10,000,000 passengers a year, depending upon weather conditions. These figures do not include upward of 6,000,000 passengers a year carried on the D.S.R. feeder bus lines. All of this transportation is on a 10-cent fare or better.

The Detroit Motor Bus Company, during 1924, carried 29,518,722 passengers, using 199 vehicles. The Detroit United Railway, since the advent of the new year, has been transferring its passengers on Gratiot, Grand River and Fort Streets by its own buses, but is not doing a local business except in occasional instances. Of the passengers detraining at the railway terminals, approximately 50 per cent are using D.S.R. service rather than D.U.R. coaches, according to Mr. Schram. If this ratio is maintained, the Department is better off financially than were it to receive the track rental for the continuation of the D.U.R. trolley cars down town. He says in part:

> Inasmuch as the average increase in revenue riders on the trolley lines of this city for the past ten years has been 15,000,000 a year, it is very apparent that the continued decentralizing of transportation, at the same time the city is spreading out and the length of haul is increasing, must result in a higher fare for the trolley car riders.
>
> Not only should an effort be made to centralize the volume of traffic to protect the car fare of the family of moderate means but extraordinary effort should be made to build it up on city-owned agencies to permit it to be thrown intelligently to the support of rapid transit. If this is not done the 32 per cent of the rapid transit cost which its riders must pay will create a prohibitive rate of fare. Rapid transit fare in Detroit must be low, because for a long time the average haul will not be long enough to attract patronage merely because of time saving.

Mr. Schram says that whenever the Council so desires his department is prepared to show the traffic on the streets and the increased running time were the city to substitute 100 per cent bus operation for trolley operation. Of the Jefferson Avenue situation, with service by trolleys, buses and jitneys not co-ordinated, he says it is absolute transportation waste, especially when the city is thinking of supporting rapid transit. Mr. Schram says further:

> To keep a low universal fare, frequency of trade and a high riding habit, urban transportation must be centralized. There must always be a sufficient surplus to permit of service to the outlying districts before they have sufficient traffic to meet the cost of that service. This is a particularly important thought in connection with the vast annexation which has taken place in this city.
>
> While this miscellaneous bus and jitney

> transportation has been growing up, absorbing part of the possible financial returns for the centralized transportation organization, the city railway department has been putting in some 42 miles of feeder bus routes, at a deficit to itself. There is a great deal more of this pioneering service which we are ready to develop, and for that reason we are rather anxious to understand what control your honorable body will assume over the miscellaneous smaller systems being developed at the expense of the outlying residents and the riders who cannot afford a higher fare. Our plans for major type bus operation are being studied constantly, but we felt that it would be advisable to withhold final decision until we had some expression from your body as to the possible procedure in connection with rapid transit development. If it is planned to go ahead on a large scale with rapid transit there is a question of the advisability of investing in a great bus operation to take much needed patronage away from the tubes.
>
> If rapid transit is going to be limited to one or two routes, then we believe we would plan bus operation co-ordinated with trolley service, using the trolley for local and the bus for express, or the other way about. It is our opinion that this development in transportation is coming. It has been held up because in most cities there was or could be no common ownership of trolleys and buses.
>
> In the matter of bus and jitney regulation, there are legal points upon which you will undoubtedly desire advice from the Corporation Counsel. It you desire definite recommendations, we will report further.

In closing, Mr. Schram reiterates that in fixing future policy the rate of fare, be it subway, bus or trolley, should be the starting and finishing point. He says the plans for transportation relief are easily developed, but that the sustaining patronage is not. His closing remark was that 85 per cent of the travelers use the street cars, mostly because of the low rate of fare.

Men at Altoona Pay Tribute to Management

A remarkable tribute was recently paid to Scott S. Crane, vice-president of the Altoona & Logan Valley Electric Railway, Altoona, Pa., by the men who have worked under him. When news of the purchase of the road by A. E. Fitkin & Company, New York, became public, the members of the local union remembered the cordial relations which Mr. Crane had always fostered between management and men, and they felt that the time had arrived for an expression of their appreciation.

This expression took the form of a resolution sent to the new owners, in which the men expressed their wish that he be continued in office. In part it follows:

> His daily association with employees, his personal interests in those things which have meant better working conditions, his good, fatherly advice, given gladly and freely, to all who seek him, and it being apparent that his every effort is intended to solidify and strengthen the kindly feeling between employer and employee; his unswerving attention to duty, his undoubted honesty and integrity, have so linked him to the organization that we are impelled in fairness to him, and seeing also a continued benefit to ourselves and the organization voluntarily to recommend and indorse our friend, our adviser, our protector, our general manager for continuation in the office he has filled so well and so honorably during all these years.

The new owners in a letter from T. R. Crumler, president of the General Engineering & Management Company, expressed their gratification at this display of loyalty and appreciation and announced Mr. Crane's advancement to the position of vice-president in charge of operations. The letter assured the employees that the management was greatly interested in having "Mr. Crane continue the excellent work that he has carried on for so many years and in which you have assisted him by close co-operation and faithful service."

Preparations for Boston Arbitration Under Way

Trustees of the Boston Elevated Railway have selected Roland W. Boyden, Boston attorney, to represent them in pending arbitration proceedings with the carmen. This marks a departure in annals of local railway arbitration. By choosing an arbiter with no affiliation with the road or its management, the Elevated has taken the first step to "neutralize" the entire membership of the board. Heretofore, only one of the three members was neutral, the two others being closely identified with the parties to the arbitration.

The agreement between the company and its men expires on June 30. The contract now in force was negotiated last year. Judge John D. McLaughlin was the neutral arbiter. His award called for a 2½-cent increase in the hourly wage to 72½ cents, or an additional wage expense of $500,000 a year.

No Constructive Action at Rockford

Mayor Hallstrom of Rockford, Ill., has vetoed the ordinance to the Rockford City Traction Company, passed by the outgoing City Council as its last act. The veto was delivered to the new Council after Col. Arthur E. Fisher, counsel for the traction company, had written a letter to the Mayor offering to change the wording of the franchise to specify 100-lb. T-rails and also to pave wherever necessary instead of the specification "to keep pace with the city's improvement program."

On the other hand, Council members composing a transportation committee, which has been considering merits of the proposal which had municipal ownership as an ultimate goal have recommended "no action" on its franchise. At the same time W. C. Sparks, manager of the Rockford Traction Company, and A. D. Mackie, general utility manager of the holding company, are reported to have gained important concessions on the sections opposed by Mayor J. Herman Hallstrom.

Subway on San Francisco Waterfront a Relief

A new subway at the foot of Market Street, San Francisco, and at its intersection with the Embarcadero was put in operation on May 2. The general contract for the construction work was let to the Tibbitts-Pacific Company on Nov. 1, 1923, the Market Street and the Municipal Railways each being assessed 12½ per cent of the cost. Unusually difficult water-seepage conditions were encountered. This delayed completion of the project, set for Aug. 31, 1924.

The subway is 986 ft. long. It consists of two open sections, of equal length, and a closed section 390 ft. long. The structure is 23 ft. wide and 13 ft. high, with approach grades of 3.75 per cent. It will be used entirely by vehicular traffic, all of which will be deflected underground, thereby permitting the free movement of street railway cars and pedestrians on the thoroughfare above. At this point on the Embarcadero the movement of vehicles averages 800 an hour between 7 a.m. and 5 p.m. This has caused a stoppage of street-car movement for more than 40 per cent of the daytime.

Railway Service Restored in Ambridge

Railway service was resumed in Ambridge, Pa., on May 1 by the Pittsburgh & Beaver Street Railway following a suspension of two weeks. Operation was not resumed, however, until after the Borough of Ambridge had rescinded its former order turning down the company's proposition for the reconstruction of track in Ambridge and ordering the company to cease operations in the borough. The day following the cessation of service the Beaver Valley Motor Coach Company, an affiliated company, started a twenty-minute coach service through the Boroughs of Ambridge and Leetsdale to Sewickley.

The fight in Ambridge dates back two years. The company refused to participate in a paving program which would have cost it about $170,000. It contended that this was unduly burdensome. Conference, compromise and further contention followed until endless litigation involving not only the Pittsburgh & Beaver Street Railway but also the Beaver Valley Traction and the Philadelphia Company, the holding company for both companies, brought the issue to a lower court and then to the Supreme Court. Both courts concurred in the opinion that if the Beaver & Pittsburgh Street Railway did not comply with the requirements the borough should order operations discontinued and proceed with its paving program.

Bids were to be opened on March 16, but a committee of citizens interceded and conferred with the company, stating that in their opinion the Council would agree to a single track and that the borough would stand the cost of paving between the rails and maintaining it. Although the company was prepared to abandon the road it finally made such an offer to the Council. This was turned down, and a counter proposal was made similar to that submitted by the company but that a rental of $100 per 1,000 population should be paid in lieu of paving relief. A new proposal was made whereby the company agreed to pay a rental charge of $1,200 a year if it were earned and if the company could first pay the interest on its bonds. Under this arrangement the railway was to increase the rental as traffic increases. The borough turned this down. It declared that it wanted its rental to be a charge against earnings ranking ahead of bond interest.

The company had never withdrawn its proposition and when it received notification of the final action taken by the borough it arranged for the resumption of service on May 1.

Atlanta Employees Receive Increase of 3 Cents an Hour

Wage increases to employees of the railway department of the Georgia Railway & Power Company amounting to approximately $126,000 a year were awarded May 14 by the board of arbiters.

The increase which was decided upon is 3 cents an hour for motormen and conductors on the railway and 6 per cent on present wages to other members of the union employed by the company. The new scale of wage is to be effective as of May 1, last, and is to continue in effect through Dec. 31, 1925, or as long thereafter as may be mutually agreeable to the company and the union. Notice in writing may, however, be given by either side at least ten days in advance of a desire to negotiate a new wage scale after Dec. 31, 1925.

The new scale is as follows: First nine months of service, 46 cents an hour; second nine months of service, 51 cents an hour, and thereafter, 54 cents an hour.

The former scale was: First nine months of service, 43 cents an hour; second nine months of service, 48 cents an hour, and thereafter, 51 cents an hour.

Two of the three members on the board voted for the increase. The third member, C. Murphey Candler, representing the power company on the arbitration board, filed a dissenting opinion.

In his dissenting opinion, Mr. Candler pointed out that only three cities in the South were paying higher wages than Atlanta, and that the street railway had received approximately 600 applications for work during the past year at prevailing wages, only 80 per cent of which could be filled. The increased cost of living in Atlanta was given by Edwin F. Johnson, the umpire on the arbitration board, as the reason for his voting in favor of an increase in wages.

After the board had rendered its decision Preston S. Arkwright, president of the Georgia Railway & Power Company, issued a formal statement expressing disappointment at the increased expense placed on the company, but making it clear that the company did not grumble at the wage increase. He said he only wished that there was somebody with the power and willingness to award the street railway itself a living wage in the interest of the men and the town.

A Duke Rumor Denied

James B. Duke has taken occasion vigorously to refute reports that he has been buying the stock of the Norfolk & Southern Railroad for purposes of control. He said:

> I do not own and never have owned a share of stock in the Norfolk & Southern Railroad, and have not ridden on any part of the railroad during the last twenty years. There exists no basis whatever for any such rumors or statements.

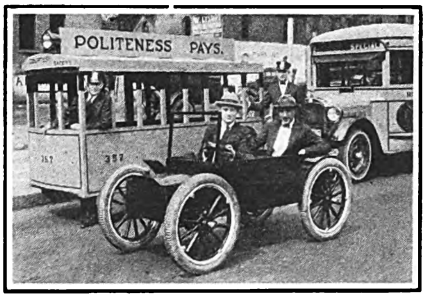
Gossip had it that an extension of Piedmont & Northern was planned to cut the state in half with an electric line through the industrial section and provide easy transit to and from the university Mr. Duke is building at Durham. Said rumor:

> The territory would provide a growing stream of freight traffic. With the Dukes in control of Norfolk Southern it would be easy to electrify the road and fit it in with the Piedmont & Northern.

The only trouble is that Mr. Duke doesn't see it that way—not at present, at least.

Politeness Emphasized in Detroit Safety Parade

Trust the Department of Street Railways at Detroit to do something original whenever the occasion demands. Safety week at Detroit, which opened on Sunday, April 26, saw the department all set. Its exhibit did, in fact, comprise a most imposing division, with trolley cars, motor coaches and the latest type of snow-fighting equipment, decorated with banners setting forth safety slogans. All these were supplemented with the department band and a platoon of trainmen, natty in appearance and snappy in bearing, evidence that the day of the unkempt platform man has passed into the limbo of things forgotten.



The "You First, Alphonse" Twins

There was, of course, the usual parade, with attractive floats representing city departments and civic and industrial organizations. Neighboring suburban towns participated.

The outstanding feature of this division, however, was the absence of the time-worn wrecked trolley car and automobile. These were replaced by a diminutive trolley car and auto, each propelled by the foot-power of two men who rode inside each vehicle.

While passing down the avenue these equipages alternated in getting into each other's way, and just when a collision seemed inevitable each would stop, driver and motorman alight and, with smile and bow, surrender the right-of-way in turn, to show that politeness, rather than insistence upon constitutional rights, was a powerful factor in averting accidents.

The contention of the Department of Street Railways was that there was nothing constructive in showing the effect of carelessness in the form of a wrecked auto or trolley. It was felt, however, that education along lines of safety could be better demonstrated by illustrating how accidents could be avoided. That this theory was correct was proved by the many favorable comments and hearty applause along the line of march.

Panic Follows Short Circuit in Interborough Subway

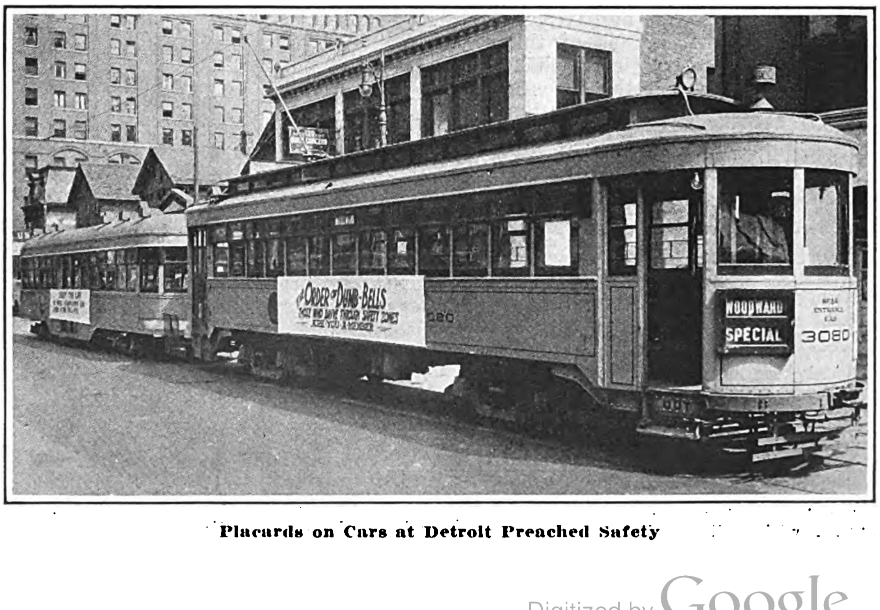
More than 100 persons were injured on May 19 in a panic that followed the short-circuiting of a car in a City Hall local on the Lexington Avenue subway of the Interborough Rapid Transit Company, New York, a train's length south of the Grand Central station.

The train developed a short circuit accompanied by the usual loud report and flash. The circuit breakers in the substation tripped immediately and cut off the current.

The short circuit occurred at 9:03 a.m. and the power was off from that moment until approximately 9:40 a.m., having been shut off from both the local and express tracks in order to prevent any possible danger from the third rail to passengers walking in the tunnel.

The car in which the accident occurred—No. 4,292—was a trail car, without motors. It had been thoroughly overhauled in the general repair shop at 148th Street on Feb. 24, 1925, and all cables and electrical apparatus subjected to a high voltage test and found to test clear. The day before the accident this same car was inspected and the mechanical and electrical apparatus adjusted in the temporary inspection sheds at Whitlock Avenue.

The cause of the short circuit is not known, but an investigation is being conducted by the railroad, the Transit Commission, the Fire Department and other authorities.



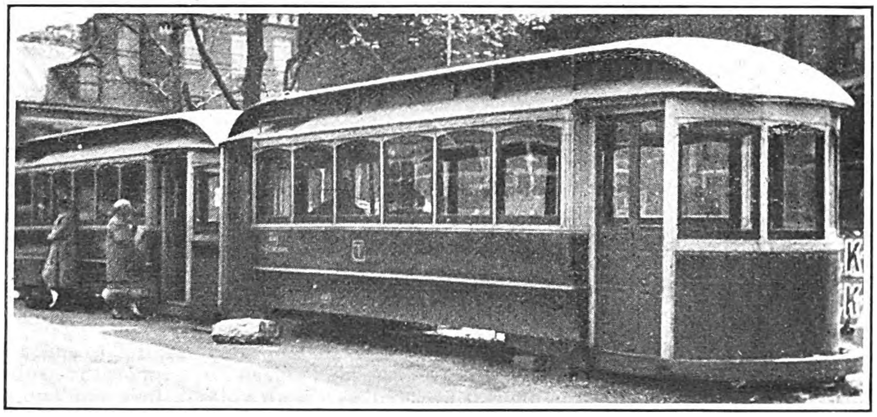
Placards on Cars at Detroit Preached Safety

Recent Bus Developments

Definite Statement of Boston & Maine's Bus Policy — Governor of Michigan Vetoes Bus Bill—Other News

PLANS are announced by the Boston & Maine Railroad for the bus operation it purposes to substitute for railroad service in Massachusetts and New Hampshire. Routes for about 100 miles for buses and motor trucks have been outlined by the company. Bus and truck lines will be established by the Boston & Maine Transportation Company, acting as an automotive auxiliary to the rail system, for those communities where any new service is warranted. The list of lines on which petitions are now pending for a bus service includes the Newburyport, South Reading, North Weare and New Boston, Wilton-Keene and Bethlehem branches.

The company states that on some of these branch lines local interests have announced their intention to operate independent bus and truck routes, either for hire or to care for the transportation needs of their own industries. As the institution of motor operations by the Boston & Maine Transportation Company on these branch lines is proposed solely to see that the communities are served, it is not planned to operate generally in competition with such independent services.



Old Trolley Cars Make Commodious Bus Waiting Room

In Portsmouth, N. H., the Boston & Maine Transportation Company has started a bus line of seven coaches with service to North Beach and Cable Road, as well as other sections of the city where electric railway service has been in operation. Four of the buses are in green and gold with seats of Spanish leather and semi-balloon tires. They are of White construction, seating 25 passengers each. Three of the buses, seating 21 passengers each, are of the Brockway type with similar color scheme.

In a statement the company said in part as follows:

> These motor bus and motor truck lines will be established with a view to increasing their usefulness and to promoting permanency, because they must be self-supporting to continue. While the changes will involve some inconvenience, they will also effect some appreciable betterments in service and economies in operating costs. Studies indicate that in a number of places there will be, under motorized operation on the highways, a considerable improvement over steam operations by rail. All motor bus and motor truck routes will connect with railroad lines.

The Twin City Rapid Transit Company, Minneapolis, Minn., has applied to the State Railroad and Warehouse Commission for four bus route permits—one 16-mile line to White Bear Lake, St. Paul's summer resort; one to Minnetonka, Minneapolis' summer resort, and two lines in North Minneapolis. Suburban electric railway lines of the company already serve the resort districts, but the buses will be used to supplement them. Other bus lines will operate from St. Paul to Minneapolis.

Old trolley cars have in the past been used for bungalows and for restaurants, but the Trenton & Mercer County Traction Corporation, Trenton, N. J., has apparently hit upon a new use for some of its obsolete cars. Pending the construction of a terminal on the vacant lot on Perry Street near the heart of the city, that property is being used as parking space for the buses of the Central Transportation Company, a subsidiary, and two old trolleys with trucks removed have been converted into a waiting room divided into two parts, one for men and the other for women. The station is lighted and heated by electricity from the trolley wires.

Bus service from Frankford to Morrisville has been started by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. The Somerton line opened on May 20. These two bus routes are the first steps in a comprehensive plan for bus operation which will become effective gradually throughout the summer.

The Illinois Power & Light Corporation has announced that it will not act upon the state authority to suspend service on New Street, Church to Green Street, and on Green Street from New Street to Prospect Avenue, Champaign, Ill., until the city begins repaving those thoroughfares. Buses will replace the cars.

Discontinuance of railway service on State Street, San Diego, Cal., between Broadway and Ivy Streets by the San Diego Electric Railway, in conformity with the recommendation of the City Council, and the substitution of motor coach service have been authorized by the Railroad Commission.

The Des Moines & Central Iowa Company has been authorized to operate a bus line between Des Moines and Newton, Iowa. The Des Moines City Council acted formally to approve the routes through the city.

The Tennessee Railroad and Public Utilities Commission recently asked the state's Attorney-General if the commission could regulate buses. The request was made after the Tennessee Electric & Power Company had asked the commission to approve a franchise for the company to operate a bus line between Chattanooga and Mission Ridge. The company was granted the franchise by the city of Chattanooga and the county of Hamilton, but had also to apply to the commission under the public utilities law. During the last Legislature a bill was defeated which would have placed buses under the jurisdiction of the commission. Since that time it has been declared that the commission has the power to regulate buses under the provisions of amendments to the railroad commission act enacted in the Legislature of 1915. It is this point which the commission wishes to have Attorney-General Thompson clear up.

Governor Groesbeck of Michigan has vetoed a bill passed by the Legislature which would have allowed electric railways to operate bus lines supplemental to their existing lines or in lieu of such lines between cities and villages already served, without being required to secure permits based on necessity and convenience. Local consent to the change or extension only would have had to be secured. The Governor stated that neither this bill nor the present statute adequately protects the public in the matter of common carriers. A more comprehensive plan of controlling their operation must be devised, he said.

The City Council of Canton, Ohio, has authorized the abandonment of a spur car line in Belden Avenue and the removal of the tracks. Officials of the Northern Ohio Traction & Light Company said that bus service would be operated through this territory.

Another instance of a refusal on the part of the commission to grant a petition for a bus line because it conflicted with adequate service supplied by electric railway lines was noted recently in the State of Utah. The petition of Wilford Baugh and I. B. Glenn for permission to operate a bus between Wellsville and Richmond in Cache County was denied by the Public Utilities Commission on the ground that the present service offered by the Utah-Idaho Central Railroad of Ogden and the Oregon Short Line Railroad of Yakima, Wash., between the same points was adequate and accommodated nearly all the people who would be served by the bus line. The commission found that in one section where the railroad service was not so convenient to the residences as the bus line a majority of the residents had automobiles.

A new through de luxe stage service was started on May 18 by the Portland-Seattle Stage Company between Seattle and Portland and between Seattle and Vancouver, B. C., by the Seattle-Vancouver Stage line. Announcement of the service was made by W. H. Somers, traffic manager for the Puget Sound Power & Light Company. The distance covered in the run from Seattle to Portland is 205 miles and from Seattle to Vancouver 165 miles. All equipment was specially designed and built for this service.

Election results at Denver on May 19 show that the proposed franchise for the Denver Tramway to operate buses was rejected. The franchise was asked in the name of the Bus Tansportation Company, organized by the trolley company. It was planned to use ten buses at the beginning with a 10-cent fare, as compared to the 7½-cent fare on the trolleys. Transfer from one bus line to another was provided. The bus routes were intended to cover outlying districts.

The Morris County Traction Company, Morristown, N. J., has purchased the bus lines formerly operated by Arendasky Brothers of Netcong, N. J. These lines connect with the railway at Landing and run to Netcong and Stanhope, a distance of 4 miles. In addition to this the railway will start a new line to run from its terminal at Landing to Bertrand Island. a distance of about 2 miles. This will be a summer service to start Decoration Day.

First steps to operate a network of bus lines radiating from Syracuse have been taken by the Mid-state Coach Lines, controlled by four electric railways, in petitions filed with the Syracuse Council for a line between Syracuse and Auburn. The petition was presented by T. C. Cherry, president of the coach company and also head of the Rochester & Syracuse Railway. Mr. Cherry said that his bus concern eventually would operate from Syracuse in all directions. Applications for franchises to operate in the cities of Oswego and Auburn have already been filed. The Mid-state Coach Lines expect ultimately to extend its Syracuse-Auburn line to Rochester.

The Black River Traction Company recently petitioned the City Council of Watertown, N. Y., for the privilege of discontinuing its electric railway from State Street over High, Factory and Pearl Streets. At the same time the Watertown Transportation Company, which operates Watertown city bus routes, requested the city to grant it the right to operate buses over these routes. The traction company explained that the line did not pay cost of operation. It offered to give to the city the rails rather than pay for tearing them up. Officials of both companies say they have under consideration a plan for the issuing of transfers from trolley cars to buses and vice versa. The transportation company is controlled by officers of the traction company and this move is regarded as the forerunner of a program of expansion of the bus lines in the city.

Fare Changes Sought on Georgia Interurban

Petition for a revision of fares between Atlanta and Marietta, Ga., was filed recently with the Georgia Public Service Commission by the Atlanta Northern Railway.

The petition seeks to adjust rates on the basis of a 7-cent zone instead of the 6-cent zone, with the purpose in view of producing a net annual earning of $64,000 for the company—a sum agreed upon by its officials and a committee of its patrons as being a fair return upon the value of the property employed and cost of service rendered.

The 7-cent zone rate, the petition sets out, is a compromise fare, fixed tentatively by agreement between the company and its patrons with the understanding that if, after six months trial, it should fail to produce earnings at the rate of $64,000 a year, the fare would be subject to further revision by the Public Service Commission.

The average rate of increase would be slightly less than 15-100 of a cent per mile as applied to the 54-ticket commutation books in general use by the regular customers of the line, if the schedule in the petition is adopted.

The Atlanta Northern Railway, it will be remembered, recently forced the elimination of unfair bus and jitney competition by discontinuing its service to Marietta and dismantling a part of its line. The increase in fares asked is a measure attempting to put the interurban line back upon its feet. It has been a losing proposition for years.

Humorous Tone in Interborough Fare Plea

Notice was filed by the Interborough Rapid Transit Company on May 15 with the Transit Commission that the expenditure of $20,000,000 for lengthening subway platforms cannot be undertaken unless the subway fare is raised to 7 cents. The tone of the communication was most unusual. Packed away in it was a smile. It will well repay anyone's rereading. The Interborough brief states:

> Everybody in office and everybody who hopes to get into office is for the continuance of the 5-cent fare. Mayor Hylan hopes to be re-elected because he is for a 5-cent fare. His opponents hope to defeat him because they are for the 5-cent fare. The Transit Commission has been against any increase in the 5-cent fare since the day it took office. So has the Board of Transportation. It has been said that the 5-cent fare, having been written into the contract, has passed out of the realm of discussion. It has become as unchangeable as the law of the Medes and Persians. The president of Columbia University is reported as saying that the 5-cent fare is a political necessity, but an economic impossibility, or words to that effect. It is a grand chorus. Mark Twain might have written it thus: "Stick, brothers, stick. Stick with care. Stick for the sacred 5-cent fare."
>
> Does any one of these proponents of the 5-cent fare believe that if the truth were brought home to these passengers he would escape their just wrath? But the truth is not told. There is a conspiracy of silence. The operating company is blamed for the congestion. It is the scapegoat for the sins of omission of the 5-centers.

George McAneny, chairman of the Transit Commission, stated that his mind "is undeniably made up" that the next measure of relief in the subway —lengthening of the platform stations —must be undertaken. The question at issue, he said, is whether the improvement comes properly within the addition and extension clauses of the dual contracts, and how the financing is to be arranged.

The Corporation Counsel on behalf of the city supported the order for longer platforms, arguing that the added revenue to be obtained by the company would be adequate compensation; that the Interborough is compelled by terms of its contract to make the improvement, and that the financial operations of the company have been profitable.

Charges Slavery in Dayton

Locked out employees of the Dayton Street Railway, Dayton, Ohio, have been operating a bus service in an effort to re-establish themselves in employment. The Dayton Street Railway is opposed to this activity on the part of its former employees and has gone into a court of chancery on a petition for an injunction to restrain the local from operating the bus line. The lower court declined to grant the injunction, and an appeal was taken. This case is yet in the appeal state. The *Motorman and Conductor*, the official paper of the Amalgamated Association, shows its attitude on the issue as follows:

> This situation shows to the extreme what union-smashing employing managements will do, even at the inconvenience of the public, to hold employees in subjection, and this is an illustration of the extreme tyranny of the make-up of the management of the Dayton Street Railway property. The Czar of Russia had nothing on the chief director of this property. Even though slavery, as it existed 70 years ago in our Southern states, was abolished, the spirit of Simon Legree is yet abroad.

Mr. Doherty's Toledo Offer Rejected by City

The railroad committee of the City Council at Toledo, Ohio, has agreed with the members of the street railway board of control in flatly turning down as not feasible the suggested solution of the transit problem of Toledo by turning over to local parties the control of the company provided $1,500,000 in preferred stock of the Community Traction Company were purchased. The Council committee wants to give Henry L. Doherty another chance to bring forth some solution to the problem of better service and lower fares.

The Council of the city now has before it the offer of a complete bus system by the City Wide Coach Company, incorporated here recently by outside interests, to operate on a 5-cent fare if given a 25-year franchise.

Pittsburgh Pass at $1.50

The Pittsburgh Railways will offer to its riders on June 1 a weekly pass at a cost of $1.50 with unlimited riding privileges for 24 hours in the day on all cars in the first fare zone originating in downtown Pittsburgh, Pa., except interurbans. Thomas Fitzgerald, vice-president of the company, in announcing the pass, said it would be placed in effect for an indefinite trial and might be withdrawn at any time. The use of the pass will eliminate the necessity of transfers and will result in a speeding up of car service.

News Notes

Mansfield Adopts Weekly Pass.—On April 20 the Mansfield lines of the Ohio Public Service Company adopted a new scale of fares, including the weekly pass. The old scale called for 8 cents cash and seven tokens for 50 cents. Under the new scale casual riders pay 10 cents, semi-regular riders use tokens purchased five for 40 cents, and wholesale riders make use of the unlimited ride transferable pass, sold for $1.

Fares Lowered.—In an effort to increase its business and check the inroads of the automobile the Kingston, Portsmouth & Cataraqui Electric Railway has reduced its fare in Kingston, Ont., from 7 cents to 5 cents. No special rate will be given to workmen or children.

New Contract Submitted. — Employees of the Community Traction Company, Toledo, Ohio, have submitted a new contract to Vice-President J. Frank Johnson to replace the one which expires on June 1. No definite details of its provisions have been disclosed. It is understood the men asked for a 10 per cent increase in wages.

Committee to Report Named.—The legislative recess committee of Massachusetts which has been appointed to study the Boston Elevated Railway, and report to the next Legislature on the questions of extended public control of the road, public ownership and the creation of a metropolitan transportation district, is composed of Senators Warren of Arlington, Fish of Brookline and Gifford of Salem, Representatives Shattuck of Boston, Richardson of Malden, Hays of Brighton, Carr of Boston, Schuster of Douglas, Luitweiler of Newton, Coyne of Boston and Hickey of Boston. Of these men Senator Warren, Representatives Shattuck, Richardson and Coyne were members of the recess committee of last year which reported on the Elevated, but differed on some of the principal issues so that no legislation could be obtained without further study. The present period of public control of the Boston Elevated Railway can be terminated in 1928, and this is a handicap for the trustees in planning future extensions of the system.

Seeks Higher Fare.—The Fort Smith Light & Traction Company, Fort Smith, Ark., filed with the City Commission recently a petition for an increase in intracity fare from 7 cents to 8 cents and an increase of 5 cents for interurban traffic between Fort Smith and Van Buren. The existing interurban rate is 7 cents.

Letters Commend Trainmen.—How the platform men of the Department of Street Railways, Detroit, Mich., are winning the public favor is shown in a large poster prepared by Ross Schram, general manager. Here are reprinted extracts from letters taken from the mail of one week in which complimentary remarks are written on the work the motormen and conductors are doing toward selling the railway service. The poster is entitled "Keep It Up Fellows!" Mr. Schram says that the management certainly appreciates the attitude of the men, but assures the employees that they themselves will reap the biggest benefit.

Higher Fare Authorized. — The Elmira Water, Light & Railroad Company, Elmira, N. Y., was authorized by the Public Service Commission to put into effect a 7-cent zone fare on May 10. Between zones the charge is 14 cents. The company has been charging a 6-cent rate. The company applied for the higher fare in order to increase certain men's wages.

"Walking Transfer" in Effect.—The St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., has put into effect a "walking transfer" system, permitting patrons of the Morganford bus line to transfer to the Southampton and Vandeventer car lines, although the buses do not intersect those lines. Inability to secure a permit to run the buses through Tower Grove Park resulted in the walking transfer plan. Under the new plan bus or street car patrons may transfer from either line to the other by walking through the park, a distance of about five blocks. The St. Louis Bus Company has also established a bus belt line in Northwest St. Louis by consolidating the Natural Bridge and West Florissant-Helen Avenue lines.

Fares Increased. — The New York Public Service Commission recently authorized the New York & Stamford Railway to put into effect a 7-cent fare on three days' notice. The fare in the first zone, the city of New Rochelle, will remain at 5 cents, but in the five other zones the fare will be increased from 6 cents to 7 cents. The company showed at the hearings that deficits have been sustained each year for several years, and declared that the increased fares were necessary to meet the paving requirements of the various communities. The road extends from New Rochelle through the villages of Larchmont, Mamaroneck, Rye and Port Chester to Stamford, Conn. The various municipalities have given their consent to the increase in rates, which are to remain in effect for one year.

Testimony Concluded. — The final argument before the arbitrators in the wage dispute affecting the employees of the United Electric Railways, Providence, R. I., has been heard. More than 4,000 sheets of testimony and nearly 200 exhibits were taken. Both parties to the controversy have agreed to accept and abide by the forthcoming decision until June, 1926. The present scale is 56, 59 and 61 cents an hour.

Trainmen's Recreational Buildings Started. — The Pittsburgh Railways, Pittsburgh, Pa., recently started construction of what is to be an enormous recreation center for trainmen and their families, and for special service to the public. Ten social service buildings are to be built, under the general welfare and recreational project recently launched by the company, at a cost of more than $500,000. The ground breaking took place recently in Ingram. In each building there will be established modern, well-equipped emergency hospital rooms.

Demands Referred to Trustees. — Wage demands of the trolleymen's union which have been filed with President J. K. Punderford of the Connecticut Company, New Haven, Conn., will be referred by him to the trustees. The present agreement will expire on June 1. The demand is a wage scale of 70 to 75 cents an hour for operators, whereas they have been getting 55 to 60 cents; 80 cents an hour for operators of one-man cars and 90 cents for bus operators. There is said to be a separate discussion pending over the employment of bus operators. It is understood that trolleymen are asserting that they should have first call on bus positions, but the company has been hiring outsiders.

Will Operate Buffet Cars.—It is reported that the Union Traction Company plans to operate buffet parlor cars between Indianapolis and Fort Wayne, by way of Muncie.

Higher Fare Avoided. — Through agreement with the St. Paul City Railway, St. Paul, Minn., the city has avoided segregation of the South St. Paul suburban car line and a larger fare rate between the cities. This rate is now 6 cents from any part of St. Paul to any other part of the city. The company may charge $20,000 a year to operating expense and lease the South St. Paul line. Otherwise the Railroad and Warehouse Commission would be required to fix a fair rate of fare based on the valuation of this property of the Minneapolis & St. Paul Suburban Railway. The St. Paul city attorney notes that on the basis of 75,000,000 fares, as in 1924, and a 7-cent rate of fare the St.Paul City Railway would net $1,300,000. This would be $100,000 more than a return of 7½ per cent on the valuation of the St. Paul lines, so the additional charge of $20,000 would have no particular effect.

Vote to Renew Contract.—Employees of the Rochester, Lockport & Buffalo Railroad, Rochester, N. Y., have voted to renew without any change in terms the present wage contract with the management.

New Coach Pamphlet Appears.—The city of Detroit, Department of Street Railways, started in May a pamphlet, called the *Coach Rider*, to acquaint the patrons of its coaches with the activities of the city of Detroit's coach division. The pamphlet will be issued twice a month. The first issue gave some conclusive figures on passenger coach service during the month of March and for the first 90 days of its existence, which ended March 31. A list of coach lines with routes and mileage and number of coaches in service was included.

Interurban Fares Advanced. — The State Corporation Commission of Virginia has granted the Virginia Railway & Power Company a general increase in fare over its Richmond-Petersburg interurban lines amounting to approximately 25 per cent. The commutation rate between Richmond and Petersburg for 50 trips, good for twelve months, was increased 16⅔ per cent. The increases went into effect on April 20. Between South Richmond and Petersburg the cash fare for adults, effective since Dec. 16, 1923, was 47 cents with a ticket rate of 42 cents.

Financial and Corporate

Bad Year for Indiana Interurban

Deficit of $488,032 for 1924 Reported by Union Traction Company—Hurt by Auto Competition

The revenue of the Union Traction Company of Indiana, Anderson, Ind., from operation for 1924 was $3,339,187, compared with $3,890,689 for 1923, a decrease of $551,501, or 14.17 per cent. The operating expenses for 1924 were $2,656,065, compared with $2,647,123 for 1923, an increase of $8,942.36 or 0.34 per cent. The net income for 1924 is shown as a deficit of $419,632 compared with a surplus of $73,336 in 1923. Financial conditions compelled the passing of sinking fund payments during the year. Deduction of 1924 sinking fund charges, amounting to $68,400, would make the deficit for the year $488,032.

STATEMENT OF EARNINGS OF UNION TRACTION COMPANY OF INDIANA

	1924	1923
Revenue from transportation..	$3,196,640	$3,745,715
Revenue other than from transportation............	142,547	144,974
Total operating revenue....	$3,339,187	$3,890,689
Total operating expenses...	2,656,065	2,647,123
Net operating revenue.....	$683,122	$1,243,566
Taxes..........................	206,000	257,409
Net revenue less taxes......	$477,122	$986,156
Other income...............	34,304	30,998
Gross income.............	$511,426	$1,017,155
Bond and other interest, etc...	931,059	943,819
Net income..............	*$419,632*	$73,336

Figures in *italics* denote deficit.

In the operating expenses for the year are included $588,132 for maintenance of way and structures and $349,686 for maintenance of car equipment, making the total for maintenance $937,819. The increase in operating expenses for the year is due to these increased expenditures for maintenance. Other operating expense accounts showed substantial savings.

In 1924, $247,691 was charged for additions and betterments to the company's property, and $37,371 was charged for extensions and betterments to the property of the Traction Light & Power Company. The 1923 figures for like purposes were $323,158 and $66,199.

Twenty-five new freight cars and six safety or "one-man" street cars were purchased during the year at a total cost of $112,112, included in "Additions and Betterments." This purchase was financed in part through the issue of $50,000 of 6 per cent car trust notes. Fifteen steel interurban passenger cars were contracted for, to be delivered in 1925, at a cost of more than $400,000.

Freight revenues for the last six months of 1924 showed an increase over the similar period in 1923 of $9,991, or 2.45 per cent, while the gross revenues from transportation as a whole, including freight, decreased $324,293 or 17.83 per cent. The total revenue derived from freight, milk and express traffic in 1924 was $811,270, or 24.30 per cent of the gross revenues from transportation as a whole. Like figures for 1923 were $832,553, or 21.4 per cent of gross revenues from transportation.

The Marion City Railway first mortgage 6 per cent bonds, amounting to $328,000, which matured May 1, 1924, were extended at the same rate to May 1, 1929.

BONDS PLEDGED TO SECURE LOANS

In connection with financing to meet current requirements, an issue of $1,000,000 of general mortgage 6 per cent ten-year bonds dated June 1, 1924, was authorized by the directors and approved by the Public Service Commission of Indiana. Of these bonds, $700,000 were issued for use as collateral for loans and the remaining $300,000 are unissued.

President A. W. Brady says the great falling off in revenues for the year is attributable, in large part, to the increased use of automobiles in private and common carrier use.

Mr. Brady notes that the company is preparing to turn the bus to its own advantage. He says:

> Believing that there is a field for the operation of motor vehicles in co-ordination with the company's electric railway service, and in some instances in substitution therefor, a corporation has been formed under the name Traction Motor Transit Company, the shares of which will be owned by this company. The new corporation, to the end of 1924, had acquired only one bus, a Pierce-Arrow, now operated advantageously in co-ordination with interurban service at Fort Benjamin Harrison.

In referring to the receivership Mr. Brady says:

> The manifest inability of the company to meet its Jan. 1, 1925, interest and rental payments resulted in a suit by the Westinghouse Electric & Manufacturing Company in the Madison Circuit Court of the State of Indiana, wherein Arthur W. Brady was appointed receiver of the company on Dec. 31, 1924. The operations of the company's lines are now being conducted by the receiver.

2,253,847 FEWER PASSENGERS

The report of this 449-mile road showed that only 14,405,496 passengers were carried on the interurban and city lines of the company in 1924, compared with 16,659,343 in 1923, a loss of 2,253,847. As has been indicated previously a slight improvement was reported in freight business. In 1924 the company handled 211,172 tons of freight, as compared with 183,485 tons in 1923.

TRAFFIC STATISTICS OF THE UNION TRACTION COMPANY OF INDIANA FOR YEAR ENDED DEC. 31, 1924

Passengers carried, interurban lines............................	5,622,318	
Passengers carried, city lines.....	8,783,178	
Total passengers carried.........	14,405,496	
Freight handled................	211,172	tons
Express handled...............	11,713	tons
Mileage of cars, interurban lines...	6,431,107	miles
Mileage of cars, city lines........	2,027,852	miles
Total mileage of cars...........	8,458,959	miles
Coal consumed at all plants......	85,189	tons
Power generated (a.c) at all plants	43,497,064	kw.-hr.
Power generated (d.c.) at all plants	26,674,966	kw.-hr.

Twin City Wins Suit

Court Decides in Favor of Railway in Rate Suit—Hearings to Begin Soon —Case Reviewed

By a ruling of the State Supreme Court the Railroad and Warehouse Commission and the St. Paul City Railway win the first point in a legal battle which has delayed proceedings to determine an adequate rate of permanent fare to be based on the valuation of the company's property. These proceedings are at present before the commission.

The court rules there can be no appeal until the rate has been fixed. An appeal from the finding of value already made tentatively by the commission does not confer jurisdiction on the District Court. The commission made its valuation figures public on March 6. The city then obtained an order from the Ramsey District Court requiring the commission to file the valuation figures with the court. It was feared that should the Supreme Court decide for the city it would throw rate determination into the court.

CONFERENCE WITH CITY ARRANGED

Following the decision the commission notified the Twin City Rapid Transit Company, the holding company for both the Minneapolis Street Railway and the St. Paul City Railway, and the two city attorneys to arrange a conference, to be held within ten days, on the valuations and determination of rates of fare.

The City Attorney of St. Paul says he is satisfied with the court decision as it rules the city has lost no rights through failure to file appeal from any findings of the commission within 30 days.

It is found by the Supreme Court that:

> The order finding value is non-appealable, the District Court is without jurisdiction on the appeal and it should have been dismissed, and its order directing a return was without jurisdiction.

As to whether the order of the District Court directing the commission to make a return is appealable, the Supreme Court ruled:

> The city urges that the order from which the appeal is taken to this court is not appealable. The order puts the railroad to the burden of considering in the District Court the fair value of the railway property, though no rate has been established, and, though the court has not jurisdiction, it takes from the commission the authority vested in it by the statute to proceed to the fixing of a rate. The appellants challenge the jurisdiction of the court to proceed further, and they are met by an adverse ruling. It should have been in their favor.

Actual hearings before the commission in the rate determination began in October, 1923. The subject had been under discussion for several years prior to that time and continued to be an active issue at intervals until March, 1925.

The tentative valuations of the St. Paul and Minneapolis railway properties were handed down on March 6, 1925. The order by the lower court for the commission to file a valuation of the St. Paul company with the court was made on March 9. The Supreme Court decision was made March 15, 1925.

New Holding Company After More Properties

The Electric Power & Light Corporation, New York, the holding company organized by the Electric Bond & Share Securities Corporation for utility properties in Utah, Idaho, Texas, Colorado, Wyoming, Oregon and Louisiana, has made an offer for control of the properties of the Southern Power & Light Company in Arkansas.

The Southern Power & Light Company controls the Mississippi Power & Light Company, the subsidiaries of which serve Jackson, Vicksburg, Delta, Columbus, Greenville and other points in Mississippi, and the Arkansas Light & Power Company of Pine Bluff.

Electric Bond & Share Company supervision already takes in certain Arkansas properties of the National Power & Light Company embraced in the Arkansas Central Power Company, which supplies electric power and light and railway service in Little Rock and North Little Rock. The consolidation of the properties of the Southern Power & Light with the Electric Power & Light Corporation, according to a letter of President H. C. Couch of the Southern Power & Light Company to stockholders, will place all of the latter's properties under the supervision of the Electric Bond & Share Company.

Holders of the cumulative participating preferred stock of Southern Power & Light will receive for each share one share of preferred stock without par value of the Electric Power & Light Corporation and one-half share of common stock, without par value, of Electric Power & Light. The cumulative participating preferred of Southern Power & Light has been selling in the market around $86 a share. The allotment certificates for preferred and common stock of Electric Power & Light were quoted respectively at $105 and $26 a share on May 16.

Baltimore Valuation Hearing Held Over

The hearing being held by the Maryland Public Service Commission to place a valuation on the property of the United Railways & Electric Company, Baltimore, was resumed on May 13 and after two days was held over. Most of the time during the two days was taken up by witnesses for the company called to put a reproduction cost on the property.

Charles A. Cummins, a witness for the United, testified that it would cost $5,993,501 to reproduce the company's buildings. The unit costs were challenged by Clarence W. Miles, people's counsel. A question from one of the members of the commission as to whether the company intended to make its park and resort property a part of its total capitalization brought a response from William H. Maltbie, counsel for the United, that this property would be included. He said that profits derived from the resorts were added to total traffic revenue. On the second day of the resumed hearing Adrian Hughes, Jr., superintendent of power of the United, testified as to the reproduction cost of power distribution and substation and power house equipment items. During the hearing Theodore A. Graser, engineer in charge of equipment, testified that it would cost $11,842,622 to reproduce the cars owned by the company, exclusive of electric equipment, and that the electrical equipment would cost $6,006,647.

Merger of Trenton-Philadelphia Lines Reported Under Way

Plans are said to be under way for a consolidation of three electric railways through which there would be a direct route from Bridge Street and Frankford Avenue, Philadelphia, to Trenton, N. J.

The three lines affected by the merger are the Pennsylvania & New Jersey Railway, operating from Trenton to Morrisville, Bucks County, a distance of 2 miles; the Trenton, Bristol & Philadelphia Street Railway, operating from Morrisville to Torresdale, a distance of 17 miles, and the Frankford, Tacony & Holmesburg line, operating from Torresdale to Bridge Street and Frankford Avenue, the terminus of the city-owned Frankford elevated line, 6 miles. This would give patrons from Trenton a direct line to the Elevated and into the business section of Philadelphia with only one transfer. Under the present arrangement three transfers must be made.

The tentative plan of consolidation calls for organization of a new company which would take over the three companies.

April Traffic Falls Off in Toledo

Although operations of the Community Traction Company, Toledo, Ohio, showed a further slump in riding in April a slight amount was added to the stabilizing fund. An operating deficit of $58 after all charges was changed to a net surplus of $26 through interest earned on the cash balance in the stabilizing fund. There is a deficit of $130,498 in that fund in addition to the original $400,000 which has been exhausted.

Gross revenue for April was $311,473, as compared with $347,099 last year on the lower fare basis. Operating expenses were pruned down by more than $43,000, due largely to cheaper power, cut in car mileage operated and use of one-man cars. Bus operations on feeder lines showed a loss of 3.83 cents a passenger, or a gross loss of $1,439.

In April 4,150,436 revenue passengers were carried, compared with 4,984,013 in a similar month last year and 5,370,837 in April, 1923. Commissioner E. L. Graumlich and the board members attribute the falling off in riding largely to the increase in the use of the private automobile.

Mr. Henderson Comments on Progress in Seattle

"Seattle's street railway system has met all its financial obligations promptly during six years of municipal ownership and operation." D. W. Henderson, superintendent of the system, made this statement is a recent address. He said:

> We are operating under an 8½-cent fare and will continue to do so, provided we are careful and don't attempt to make capital investments out of the earnings of the property.

Mr. Henderson also stated that out of its earnings the system has paid $4,921,400 on the principal and $3,382,000 on the interest of the $15,000,000 utility bonds issued for the traction properties. In addition, $2,420,708 has been spent on way and structures and $3,067,863 on equipment.

Conspectus of Indexes for May 1925

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares*† 1913 = 4.84	May 1925 **7.27**	Apr. 1925 **7.26**	May 1924 **6.95**	May 1925 **7.27**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	May 1925 **153.9**	Apr. 1925 **157.3**	May 1924 **160.8**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	May 1925 **222.2**	Apr. 1925 **221.6**	May 1924 **217.8**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1925 **4.45**	Mar. 31 1925 **4.86**	Apr. 30 1924 **3.33**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	Apr. 1925 **17.72**	Mar. 1925 **17.76**	Apr. 1924 **16.05**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Apr. 1925 **1658** **50.92**	Mar. 1925 **1631** **35.14**	Apr. 1924 **1726** **73.26**	Jan. 1924 **2231** **122.95**	Sept. 1924 **1277** **27.71**

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Eng. News-Record Construction costs 1913 = 100	May 1925 **207.2**	Apr. 1925 **209.6**	May 1924 **222.3**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Apr. 1925 **156.2**	Mar. 1925 **161.0**	Apr. 1924 **148.4**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	May 1 1925 **13.32**	Apr. 1 1925 **13.69**	May 1 1924 **12.56**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	May 1 1925 **193.3**	Apr. 1 1925 **194.5**	May 1 1924 **184.7**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Apr. 1925 **150.8**	Mar. 1925 **151.1**	Apr. 1924 **141**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Apr. 1925 **164.8**	Mar. 1925 **165.3**	Apr. 1924 **161.8**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

Stone & Webster Get Virginia Property

Rumors long in circulation regarding an impending sale of a controlling interest in the Virginia Railway & Power Company, Richmond, Va., have been set at rest. On May 21 it was definitely announced that Frank J. Gould, owner of the controlling interest in the company, had sold his holdings to Stone & Webster.

According to information in New York, the negotiations have been between C. A. Stone of Stone & Webster, Inc., and Mr. Gould at Paris, where the latter has resided for several years. Mr. Stone is expected back in two or three weeks. The announcement of the closing of the deal came from Richmond.

The preferred stock, of which there is $8,987,090 outstanding, pays dividends of 6 per cent per annum. The common, of which there is $11,950,500 outstanding, has paid no dividends since 1918, when a dividend of 3 per cent was made payable in stock of the Old Dominion Iron & Steel Corporation. The balance available for common dividends in 1924 was $1,681,288, compared with $806,062 in 1923 and $642,767 in 1922. In 1921 the balance for the common stock was $1,783,437.

It is believed that Stone & Webster have in mind segregating the railway from the power properties, retaining the railways and disposing of the power properties eventually to other interests.

The company owns or controls through lease practically the entire street railway, electric light and power business in Richmond, Petersburg, Norfolk (all except the line to Virginia Beach), Portsmouth and Berkeley; an interurban railway connecting Richmond and Petersburg; a line from Norfolk to Sewell's Point, where connection is made by ferry to Newport News and Old Point Comfort; electric light business of Suffolk, Va., and the City Gas Company with unlimited franchises.

Surplus Improves on San Francisco-Sacramento Line

The operating revenue of the San Francisco-Sacramento Railroad, San Francisco, Cal., for the year ended Dec. 31, 1924, showed a decrease of $42,403 over the preceding year. The operating expenses were $843,652, a decrease of $48,255 over the previous year. The surplus for the year was $42,758, as shown in the accompanying table. It represented an increase of $6,543 over 1923.

EARNINGS AND EXPENSES OF SAN FRANCISCO-SACRAMENTO NORTHERN R.R. FOR YEAR ENDED DEC. 31, 1924

Total revenue from transportation	$974,441
Total revenue from other railway operations	16,108
Total railway operating revenue	$990,549
Total railway operating expenses	843,652
Net operating revenue	$146,897
Taxes assigned to railway operation	53,780
Operating income	$93,118
Non-operating income	5,627
Gross income	$98,745
Totel deductions from gross income	55,987
Surplus	$42,758

The operations of the road for 1924 show a decrease in passenger and an increase in freight revenue, with a gain in the net over the preceding year. It has been the effort of the company by increased facilities, of which the new Union Station in Sacramento is most important, to offset the inroads made by the privately owned automobiles.

Since the organization of the San Francisco-Sacramento Railroad, in 1920, $903,157 has been expended for betterments and improvements; $168,000 in bonds have been retired to Dec. 31, 1924, and $42,000 additional bonds were retired Jan. 2, 1925. To reimburse the treasury for these capital expenditures only $200,000 in bonds has been issued to date. According to Walter Arnstein, president, it will be necessary to arrange for further financing to cover these expenditures and additional charges for capital expenditures, which are essential to develop the property successfully. The number of passengers carried in 1924 was 823,517 and the total car mileage was 2,157,329.

Michigan Interurban Sold

The United Light & Power Company, Grand Rapids, Mich., has sold all its holdings in the Grand Rapids, Grand Haven & Muskegon Railway, a high-speed interurban railroad, connecting Grand Rapids, Muskegon and Grand Haven, Mich., to Sydney L. Vaughan, vice-president and general manager of the road, and other Grand Rapids men.

City Valuation of Seattle & Rainier Line Raised

The city of Seattle's appraisal of the Seattle & Rainier Valley Railway, with a view to purchase, was raised recently from the original figure of $1,045,547 to $1,100,000. This figure, however, is below the value set by Walter M. Brown, general manager of the company. It is said the city will stand pat on the new amount. In naming the new price, Clark R. Jackson, superintendent of public utilities, explained that several items of equipment have now been taken into consideration that were omitted when the city's experts went over the properties the first time. Mr. Brown, in naming a purchase price of $1,500,000, claims a valuation $400,000 greater than the revised appraisal, including allowances for interest on construction and on bonds which members of the City Council refuse to recognize. Final purchase negotiations will be entered into when City Comptroller Harry W. Carroll audits the company's books.

Traffic Declines.—During the month of April the Cincinnati Traction Company, Cincinnati, Ohio, transported 626,910 fewer passengers than in the similar month of last year. The figures were: April, 1925, 8,079,660; April, 1924, 8,706,570. The report to Street Railway Director Kuertz shows, however, that the traction company earned sufficient revenue to meet all its obligations, including the city tax, and that no increase of fare will be necessary.

Capital Stock to Be Reduced.—A certificate has been filed in the office of the Secretary of State reducing the capital stock of the Sixth Avenue Railroad, New York, N. Y., from $2,000,000 to $1,700,000.

Seeks to Discontinue.—The Pacific Electric Railway, has applied to the California Railroad Commission for permission to discontinue through passenger service between Long Beach and Huntington Beach. The company stated as its reason the fact that the expense of operation was greatly in excess of the revenue derived.

Land Sold.—Sale of two parcels of land at Paterson, N. J., by the Public Service Railway, Newark, N. J., for $77,796 has been approved by the New Jersey Board of Public Utility Commissioners.

Stock Change Approved.—The stockholders of the Federal Light & Traction Company, New York, N. Y., have authorized the cancellation of the company's unissued 8 per cent preferred stock and the issuance of 385,625 shares of common stock of $15 par in exchange for the 77,125 shares of no par value common now outstanding. This is at the rate of five new shares for one of the old issue. The total authorization of common stock is 1,000,000 shares. The company will hereafter have only one class of preferred stock of no par value entitled to dividends of $6 a year.

Net Income Higher.—For the ten-month period ended April 30, 1925, the total operating revenue of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $35,775,680, against $32,904,417 for a similar period in 1924. The expenses increased from $21,947,237 to $23,494,442 for the ten-month period ended April 30 of the present year. After the consideration of income deductions the net income was $4,119,290, against $3,018,962 for the ten-month period ended April 30, 1924.

Chicago Interests Get Interurban.—The Illinois Power & Light Corporation expected to acquire the Galesburg & Western Interurban, now known as the Rock Island Southern Railway, on May 18 at the tax delinquency sale to use the right-of-way for construction of transmission lines between Monmouth, Ill., and the Knox County line. The company is reported to have given assurance that it would bid $7,000 on the line, on which taxes to the amount of $9,184 are due, but totaling $26,580 with various penalties. In addition the corporation is reported to have paid the Walsh interests, holders of the property, $1,000 a mile for the line, the deal having been approved by the Commerce Commission recently.

Earnings Off in St. Louis—The United Railways, St. Louis, Mo., exclusive of the Missouri Electric Railway, for the first three months of 1925 reports: Gross revenue, $4,694,174; operating expenses, $3,306,591; depreciation, $375,000; taxes, $437,913; income from operation, $574,669; non-operating income, $64,627; gross income, 639,296; interest and miscellaneus charages, $723,909; deficit, $84,612. Compared with the similar period in 1924 gross operating revenues decreased $372,356. In 1924, for the first quarter, there was a surplus of $123,990.

Personal Items

Messrs. Clifford and Bradley Advanced

George H. Clifford, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., winner of the Coffin medal last year, has been appointed Southwestern district manager over all Stone & Webster properties in Texas, Louisiana and New Mexico.

Luke C. Bradley, former district manager for Stone & Webster in the Southwest, has been promoted to division manager in charge of the Southeastern and Southwestern districts with headquarters in Boston.

Mr. Clifford has had charge of the Northern Texas property since 1910. From 1901 to 1910 he progressed through the positions of bookkeeper, assistant treasurer and general superintendent. He is a native of Tarrant County, Texas, and attended Weatherford College, Weatherford, Tex.

W. E. Wood President Southwestern Association

W. E. Wood, manager Houston Electric Company, Houston, Tex., has been elected president of the Southwestern Public Service Association. In putting an electric railway man at the head of their organization the executives of the Southwest have recognized the able and valuable service performed by Mr. Wood during the past year as chairman of the railway section. This work culminated during the recent Houston convention in a railway program characterized by many high grade papers and by frank and spirited discussion of numerous phases of the electric railway business and operation.

Under Mr. Wood's leadership, the relationship between the railway and the community in Houston have reached a stage of frank understanding. He has been a consistent advocate of unified transportation service for a given territory and has successfully brought the public to see the advantages of a co-ordinated bus and rail service to replace the former city-wide jitneys which flourished for a considerable period. In the use of buses, Mr. Wood is a believer in co-ordination of transportation management as well as service, to the end that bus and car are handled alike by the existing departmental forces of the railway.

Mr. Wood is a native of South Carolina. He was graduated as an electrical engineer from Georgia Institute of Technology and has been continuously identified with the electric railway industry since then. During that entire time he has been associated with the Stone & Webster interests in various capacities on properties under their management.

He joined the forces of Stone & Webster as an apprentice in Boston and was assigned to the statistical department. He was next sent to the Jacksonville Traction Company, where he rose from a motorman to the position of superintendent of transportation. In 1916 Mr. Wood went to Houston as superintendent of transportation and the following year was transferred to the El Paso Electric Railway, as superintendent of the railway department. In 1918 he was made manager of the Galveston Electric Company, where he remained for two years before returning to Houston as manager of the Houston Electric Company.

W. E. Wood

Carroll L. Proctor New Head of Toledo Edison Company

Carroll L. Proctor has assumed his new duties as vice-president and general manager of the Toledo Edison Company, Toledo, Ohio, succeeding B. C. Adams, who was transferred to Kansas City, to have charge of gas properties in several Southwestern states.

His first job was with the General Electric Company, at Schenectady, N. Y., at a salary of $8 a week in the testing department. Later he was made general superintendent of the Athens Railway & Electric Company, Athens, Ga., and when Henry L. Doherty & Company took over its operation in 1912 he remained with the company in the same capacity. He has been with the Doherty organization ever since. After seven years at Athens he went to Joplin, Mo., as sales manager of the Empire District Electric Company, where he remained for three years before being promoted to vice-president of the Danbury Gas & Electric Company, Danbury, Conn. From that post he was transferred back to Joplin to become vice-president and general manager of the Empire District Electric Company. He succeeded Mr. Adams there.

C. L. Proctor

Mr. Proctor was very popular with townspeople and associates at Joplin and was tendered a testimonial dinner upon his departure. The Joplin *News-Herald*, in a two-column editorial in a parting word to Mr. Proctor, says:

> Of the new type of executive, quiet, soft-spoken, tranquil, Proctor never finds it necessary to foam at the mouth and lash himself into hysterical excitement. But he is none the less efficient. Under his management the fortunes of the district's Doherty concerns have advanced signally. At the same time he has retained the friendly good will of the public—something that can only eventuate when management is based on the fine principle of real public service.

Mr. Proctor is 45 years old. He was born in Charlotte County, Virginia. After attending country schools he matriculated at Virginia Polytechnic Institute and later was graduated from that school.

Mr. Proctor is the first head of the Toledo Edison Company to be entirely independent of official duties with the Community Traction Company, which under the new arrangement will be under the direct management of J. Frank Johnson, as vice-president and general manager. Frank R. Coates, who is at the New York headquarters of Henry L. Doherty & Company, is president of the Toledo Edison Company.

Harold Evans was appointed a member of the Pennsylvania Public Service Commission on April 28 by Governor Pinchot.

Obituary

Dr. Daniel F. Hardenman, Sr., for 26 years physician for the Arkansas Central Power Company, Little Rock, Ark., died recently in Little Rock.

Charles E. Fritts died recently in Lincoln, Neb. For 22 years he was chief electrical engineer of the Kansas City Railways, but resigned that position in 1918 to enter the employ of the United Power & Light Corporation at Abilene, Kan. He retired in July, 1924.

Charles A. Russell, a member of the Massachusetts Public Service Commission from 1915 to 1920, died suddenly on May 13 on board the steamship *Boston*, while en route from New York to Boston. Mr. Russell practiced law for many years at Gloucester, Mass., where he made his home. He was born at Lynn, Mass., in 1855 and was educated at Colby College and Boston University.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Westinghouse Had Good Year

With the exception of the fiscal year ended March 31, 1919, the Westinghouse Electric & Manufacturing Company reported for the fiscal year ended March 31, 1925, the largest gross business in its history. Sales billed aggregated $157,880,292, comparing with $154,413,000 for the previous year. Except for the year ended March 31, 1919, when sales billed were $160,379,943, those of 1923-24 also were a record for the company.

Cost of sales was $144,242,065, leaving a net manufacturing profit of $13,638,227, which compares with $17,406,638 for 1923-24, when cost of sales was $137,006,280. Other income was $4,203,179, and the gross income from all sources $17,841,406. After deducting interest charges, etc., of $2,517,042, the net income available for dividends and other purposes was $15,324,364, against $16,125,303. Dividends paid on the preferred and common stock were $9,468,221, and the amount added to surplus was $5,612,606, comparing with a surplus of $8,971,647 for the previous year.

After preferred dividends of $319,896 the net income was equivalent to $6.55 a share on the $114,504,450 of $50 par value shares of common outstanding at the end of the corporate year. For the preceding year the earnings per share were $7.61 on the $103,731,450 of $50 par value common outstanding as of March 31, 1924.

The decrease in the total value of all orders booked was 5 per cent, compared with the previous year. The value of unfilled orders on March 31 was $55,271,908 against $63,738,700 at the close of the previous fiscal year.

In his report to the stockholders Gen. Guy E. Tripp, chairman of the board, says that in pursuance of a plan of decentralization by departments with the ultimate view of retaining at East Pittsburgh mainly the manufacture of heavy electrical machinery, certain lines of products had been transferred to works at Sharon, Pa., South Philadelphia and other places.

Attention is directed in the report to the several activities of the company in the interest of the social and financial welfare of its employees, "which," according to General Tripp, "the directors believe to be in accordance with an enlightened industrial policy."

Bus Manufacturer Reviews Year's Operations

According to President W. C. White of the White company the demand continues good for buses from street railway and steam railroad organizations. As Mr. White sees it, year by year the economies of the motor truck and the motor bus are contributing their share toward economy in production. More than ever, however, does he regard it as necessary for the producer and operator to realize the fullest benefits from the installation of efficient truck and bus units.

The annual rollcall of White fleets shows that 835 of the country's foremost truck owners are operating 31,025 White trucks in fleets of ten or more, an increase of 73 owners and 2,839 trucks over the record of the previous year.

In his report on the operations of the White Motor Company for the year the president calls particular attention to the organization last November of the White Motor Securities Corporation to facilitate the financing of sales of trucks and buses. The point is stressed that the White company has a total of 54 direct factory branches and service stations, which, together with hundreds of dealers' stations provide exceptional facilities to the many thousand of White bus owners. Gross sales of the White company for 1924 were $46,574,737, compared with sales of $48,876,606, in 1923.

Brooklyn Company to Spend $2,000,000 in 1925

Practically $1,000,000 will be spent this year on track reconstruction and street repaving by the surface companies in the Brooklyn-Manhattan Transit System. This does not include expenditures to be made by the Brooklyn City Railroad, which is not a part of the B.-M.T. System. The work already done this year and to be done by the B.-M.T. is being carried out so as to co-ordinate with street work that the public authorities propose to do during this year. This program has been under consideration for some time and has been substantially enlarged over that considered by the board at a previous meeting.

Nearly $100,000 has already been spent in reconstructing the surface tracks on the Brooklyn Bridge, in co-operation with the Department of Plant and Structures. In addition to this, $840,000 is to be spent on reconstruction of surface tracks and repaving incidental thereto in Brooklyn and Queens, though most of the work will be done in Brooklyn. Under this year's program, involving approximately $1,000,000, nearly 20 miles of tracks will be reconstructed. This is about 16 per cent of the total mileage of surface tracks in paved streets belonging to the B.-M.T. System. It compares with $540,000 spent during 1924 on approximately 12 miles of surface track and with $320,000 spent in 1923 on about 7 miles of surface track.

As to rapid transit lines, it was stated on May 18 that the work of lengthening the station platforms on the Fulton Street elevated line is already under way. This will allow the operation of seven-car trains to meet the increased traffic conditions on that line. The board of directors authorized an appropriation of $125,000 for this work a month ago.

In addition to these expenditures $500,000 will be spent on the Williamsburg Bridge and in the Centre Street loop. These contracts have been let. This expenditure will provide for the installation of track and line equipment of the same standard installed on other portions of the subway system.

The directors on May 18 also authorized an expenditure of $300,000 on plans submitted to it for installation of block signals and interlocking on the center tracks on the Fulton Street and West End elevated lines, together with miscellaneous additional signaling on the elevated system.

Government to Keep Hands Off Business

So far as business is concerned the developments at Washington of greatest interest recently are the remarks of the President about the hands-off policy of the administration and the Department of Commerce pronunciamento about the meaning of this country's investments abroad. The President intimated that business can go ahead with little fear of officious interference from Washington. It is urged that his statement is justified for the following reasons:

(a) The Tariff Commission, now that Mr. Culbertson is out, can operate with a clear majority that thinks eye-to-eye with the President.

(b) The Federal Trade Commission has been brought into harmony with the administration. Its new majority is not only abolishing those practices which seemed unnecessarily disturbing, but is devoting itself additionally to "constructive policies."

(c) The Shipping Board holds office "during good behavior" only and must act in a seemly manner or suffer change of personnel.

(d) The Department of Justice (opposition elements maintain) will confine itself largely to routine matters, and is not likely seriously to encourage spectacular doings.

Rarely has an administration had the subsidiary agencies of government so well under control. It has taken time to accomplish this, and it has been done without glamor. Business, therefore, has nothing to fear from administration activity. It need concern itself only, just now, with the making of major legislative policies.

Metal, Coal and Material Prices

Metals—New York	May 19, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.05
Zinc, cents per lb	7.28
Tin, Straits, cents per lb	55.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1 875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.03

As for the Department of Commerce comment, that bureau of the government states that our investments abroad "mean an increasing volume of imports, not necessarily from the countries in which the investments are made, but from the whole world." Debts to South America can be paid with European credits.

Rolling Stock

United Railways & Electric Company, Baltimore, Md., has just purchased three de luxe buses, which will be delivered the end of this month, and six additional double-deckers with all weather tops.

United Traction Company, Albany, N. Y., through its bus-operating subsidiary, the Capitol District Transportation Company, has ordered nineteen six-cylinder gasoline-electric buses from the Fageol company.

City of Detroit, Department of Street Railways, has been authorized by the Council to enter into a contract through the Detroit Street Railway Commission for 25 more buses, which, when put in operation, will bring the city's total number of buses to 90. The new bus order is split, fifteen being bought from Dodge Brothers and ten from the Reo Motor Car Company.

Track and Line

Seattle, Wash. — The utilities committee of the City Council has voted $52,550 from the city railway's depreciation reserve fund to construct a double track and pave on Twenty-fourth Avenue north between East Lynn and Hamlin Streets. This improvement will further augment the service over the Montlake line to the University of Washington campus and the University stadium.

Reading Transit Company, Reading, Pa., has started construction of a double-track line on Lancaster Avenue, from the Bingaman Street Bridge to the city line. In connection with this improvement tracks have already been laid across the new Bingaman Street Bridge. This part of the work will be finished by June 1. Approximately $275,000 will be spent on the improvements in the Eighteenth Ward and the laying of tracks across the bridge on Fourth Street from Bingaman to Chestnut and on Bingaman from Fourth to Fifth. This improvement will provide improved facilities for residents of the Eighteenth Ward and places outside of the city served by the cars on the Mohnton-Adamstown division.

San Francisco, Napa & Calistoga Railway, Napa, Cal., announced that work on the waterfront railroad line would commence on May 15. T. F. McGill has the excavating contract. The cost of the 1-mile spur will be $50,000.

St. Joseph, Mo.—Contracts have been awarded for the construction of the Sixth Street viaduct in St. Joseph, Mo., over the tracks of the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fé. The general work on the superstructure was let through the Chicago, Burlington & Quincy engineering department to the Kelly-Atkinson Construction Company of Chicago for a lump sum of $63,000. The structural and reinforcing steel will be purchased from the St. Joseph Structural Steel Company, while the construction of the approach was given to the Land Construction Company, Ballinger Building, St. Joseph. The bridge is of reinforced concrete construction, the principal items being 1,382 cu.yd. concrete, 280 tons structural steel, 75 tons old structural steel remodeled and re-erected, 1,566 sq.yd. wood block paving and 90,000 ft. sub-planking. The structure will cost approximately $131,000. The Missouri Public Service Commission some time ago allotted the construction costs as follows: Chicago, Burlington & Quincy, $46,071; Chicago, Rock Island & Pacific, $34,340; Atchison, Topeka & Santa Fé, $12,019; St. Joseph Railway, Light, Heat & Power Company, $15,583, and city of St. Joseph, $22,678.

Trade Notes

Austin Company, Cleveland, Ohio, announces the removal of its New York office to the Equitable Building, 120 Broadway. The New York staff has been increased. The Austin Company, engineers and builders, reports an increasing volume of industrial construction on the Atlantic Seaboard during the past few months. J. K. Gannett is the district manager of the New York office. A. D. Engle and D. C. Raymond are his assistants.

Smith-Springfield Body Corporation and the **Springfield Body Corporation, West Springfield,** Mass., have been reorganized. James N. Swift has been elected president of the Smith-Springfield Body Corporation, the new company, to succeed C. S. Dame; Ralph M. Sparks, vice-president, in charge of sales, to succeed A. H. Wolfe, and Hinsdale Smith, vice-president in charge of engineering, a new office. Frank M. Livingstone, former secretary of the corporation, was named treasurer, succeeding C. S. Dame, who formerly was vice-president and treasurer. L. L. Homer was elected secretary. The plant at West Springfield, Mass., will resume the manufacture of bus bodies.

Taylor-Wharton Iron & Steel Company, High Bridge, N. J., announced that G. R. Lyman, general sales manager, resigned, effective May 1. G. R. Hanks, formerly superintendent of the company's High Bridge plant, has been appointed assistant to the president, with full charge of all sales. Stanley Apgar has been appointed plant superintendent.

L. B. Foster Company, Pittsburgh, Pa., dealer in rails, has announced that it has moved its general offices to its warehouse yards at Carnegie. The company says it will still maintain a mailing office at its home headquarters in the Park Building, Pittsburgh, where the president, L. B. Foster, will be located. All other offices have been moved to Carnegie.

Forged Steel Wheel Company, Pittsburgh, Pa., announces the removal of its New York offices to 120 Broadway.

Timken Roller Bearing Company, Canton, Ohio, announces that it has purchased the physical assets of the Gilliam Manufacturing Company. The Timken company considered that this co-ordination of manufacturing capacity, processes and patents would better serve its customers. The production of both Timken bearings and Gilliam bearings will be continued in their respective plants.

Conveyors Corporation of America, Chicago, Ill., says that its American monorail cable conveyor will be handled in Ohio by H. P. Rodgers, Leader Building, Cleveland. Mr. Rodgers will have associated with him in the sale of this equipment Eugene Smith, formerly with the Galion Iron Works. E. A. Grimmer has joined the sales organization of the Lathrop-Trotter Company, Cincinnati, which is district representative of the Conveyors Corporation of America. Mr. Grimmer is a mechanical engineer. He was recently with the sales force of the Ellicott Company of Cincinnati.

H. D. Church, formerly chief engineer of the truck department of the Packard Motor Car Company and for the last eighteen months assistant chief engineer of the Chevrolet Motor Company, became identified with the White Motor Company on May 15 as director of Engineering. George W. Smith, formerly in charge of the experimental and research departments of the White Motor Company, has returned to the company as technical assistant to Thomas H. White, vice-president and general manager, and will have charge of the technical division of the staff.

Johnson Fare Box Company, Chicago, Ill., has removed its New York office from 366 Madison Avenue to 908 Eighth Avenue.

New Advertising Literature

Nichols-Lintern Company, Cleveland, Ohio, has issued a new pamphlet on "Two safety ideas for your cranes." It describes a signal light to prevent "bumping" and sand crane runways from the cab.

Irving Iron Works Company, Long Island City, New York, has issued catalog 4 A 172, on the Irving fireproof open steel flooring.

Pittsburgh Testing Laboratory, Pittsburgh, Pa., has issued Bulletin 36, entitled "Practical Motor Bus Inspection." The pamphlet describes in detail just what practical inspection of the materials and workmanship of a bus means and outlines the work of its highly specialized inspection engineers and chemists.

Alexander Milburn Company, Baltimore, Md., has issued a 24-page pamphlet, called "the Milburn Light," for contractors, railways, mines, quarries; also a 24-page booklet entitled "Milburn Welding and Cutting Apparatus." These booklets may be obtained upon request to the office at 1416-1428 W. Baltimore Street, Baltimore.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 30, 1925 *Number* 22

This Year's Exhibits Should Be of High Quality

ONLY 90,000 sq.ft. of space is available on Young's Million Dollar Pier at Atlantic City for exhibit purposes. This will all be available for the October convention of the American Electric Railway Association. If the space assignment of last year is any criterion to go by, the whole 90,000 sq.ft. will be sold out on the initial allotment. The space rate will be 65 cents per square foot, the same as for the last two conventions. Moreover, there will be no exhibits this year by either the Master Car Builders or the National Electric Light Association. Undoubtedly the committee in charge will be hard pressed to find sufficient space to accommodate all those who wish to show goods.

With this prospect of space limitation in mind, each exhibitor should use care in selecting for display the things which will be of greatest value. In the past much attention has been given to samples, beautifully finished, but not having in any respect the same appearance as the actual parts as used. Most interest frequently has been given to old and worn specimens, particularly those which have been tested to failure. A complete life history attached gives the delegate a lesson in good and bad practices that few demonstrators could teach.

While this suggestion is not applicable to all types of equipment, it should be worthy of study by the exhibitor. Every exhibit of this sort that can tell its story should be well worth while.

Centralized Transit Control Is Highly Essential

URBAN transit must be centralized under one control. This is the conclusion reached by Ross Schram, general manager at Detroit, and laid down by him as a policy to be adopted by the city if fares on the railway are to be kept down and a high riding habit maintained. It is all so self-evident that there would seem to be little need for pointing out the economic fallacies of any other scheme.

Still the process of permitting competitive traffic goes on apace, not only at Detroit, but in many other cities. Not always is it possible accurately to gage the extent of the effect of this duplication of effort. Even in Detroit Mr. Schram has been able only to arrive at a good approximation. In short, between 35,000,000 and 40,000,000 passengers a year are being handled at Detroit at a fare of 10 cents or better on buses of one kind or another. This is a menace to the Detroit Municipal Railway—not a grave menace, perhaps, but a big handicap. Mr. Schram is seeking to convince the Council of the folly of permitting this condition to continue. His summary proves the great transportation waste that is taking place under the present competitive system in Detroit. It would seem that a city operating its own system would be first to discover this. Still it has been necessary for Mr. Schram to reiterate that in fixing future policy the rate of fare should be the starting and the finishing point. Centralized and responsible transportation is the need everywhere. There is no other way in which fares can be kept down. His statement to his own Council contains an eloquent plea applicable to private companies in other cities similarly situated with respect to competition.

Some Worth-While Things the Railway Industry Overlooks

HOW often have we said of this or that man: "What great things he could achieve if he made full use of his powers; but the trouble is that he is content merely to exist or get by."

What applies to men may apply to groups of men or to industries as well. A case in point is afforded by contrasting the efforts of motor bus and of electric car operators to secure traffic. The motor bus is inferior in many respects to the electric car, but its operators are vigorous and have the ambition to please. The electric car has inherently finer qualities and opportunities, but these are less frequently developed to maximum efficiency and attractiveness.

Let us begin with propulsion, for example. A motor bus is propelled by intermittent explosions whose force is transmitted through an elaborate train of gears. Knowing this, the motor bus builders and operators keep ever on the watch for ways to smooth out these explosions by the multiplication of cylinders and by making improvements in noise-reducing schemes. A trolley car is propelled by a continuous stream of power that can be shaded to the finest degree and its gearing can readily be kept noiseless. Yet are all electric railways as keen as they might be on the subjects of resistor steps and gear teeth and lubrication?

Next consider heating and ventilation. The motor bus operator figures all the possible ways of distributing the heat from the exhaust to secure some uniformity of warmth, but how could he compete in that respect with electric heating through numerous small-capacity units with thermostatic control if the electric operator chose to give up the coal stove or the old-fashioned large-capacity electric heaters? As for ventilation—the best buses are not free from some reminder of gasoline or oil, but how many electric cars are fitted with the best available devices in ventilation —not to mention blowers or fans?

In the motor bus, entrance and exit facilities are far inferior to those of the trolley car, one reason being the greater difficulty of using power-operated doors and steps. Yet there are left plenty of trolleys which leave to the brawn of the car operator something that could be better done with the unlimited power supply in the trolley wire.

Almost everywhere, the electric car is free from the wheel housings and the over-all width restrictions that shackle the bus, but this does not mean that electric car operators invariably plan aisle and seat widths that make for comfort. The fault with many cars is that too many seats are crowded into a given area, so that ample knee room or easy seating for a pair of riders on one cross-seat is not provided. A bus man may be compelled to cause discomfort with wheel housings, but is any electric railway forced to place sand boxes, door engines or other things in places where they will annoy the patron?

But perhaps of all failures to exploit electric railway advantages, seat design is the worst. The operator of a bus knows that his vehicle would be far from enjoyable if he did not cushion the vehicle on air tires and the passenger on soft upholstery. The operators of many electric cars running on a bumpless private railway seem to think that a slat or shaped wooden seat is good enough, overlooking the fact that the soft upholstery that makes the bouncing bus endurable is the very thing that would make the smoother-running trolley truly enjoyable.

A Constructive Force in American Business

DEDICATION of the new home of the Chamber of Commerce of the United States, which was done with fitting ceremony, was one of the impressive features at the annual meeting of the chamber held last week in Washington. This organization now has attained the goal announced at its formation thirteen years ago. That was to create an organization which would crystallize the thinking of American business men so that, always keeping in mind the public interest, it would present the views of business to the public at large, to officials of the government and to legislative bodies.

This work has been done so well that the chamber has received the commendation of each President of the United States since its formation, as well as that of Cabinet officers and leading members of both houses of Congress. That the people's interest has always been the guiding policy of the chamber was the opinion quite fittingly expressed by Chief Justice Taft at the dedication. It was during his administration as President and with his approval and urging that the chamber was established. Taken together, said the Chief Justice, its members have no selfish or other aim, narrow or contracted, that blinds them to the general good. They are not men of one idea. As much as any one set of men, they have the spirit of good will to all elements of our society.

The value of the chamber should not be overlooked by those in the transportation business, particularly electric railway men. That its department of transportation and communication is concerned with problems that are of vital interest to the industry was evidenced by the meeting of that group. High among the officers of the chamber are men prominent in the electric railway and utility fields.

It behooves those who have the best interests of the country and of their communities at heart to see to it that the thinking of the chamber is conducted along sane and constructive lines. With this done, its influence in molding public opinion, both nationally and locally, cannot fail to be of great help in preventing wild and impractical ideas from dominating the various governing bodies. On the other hand, the chamber can be of immense value to electric railway executives in bringing before them the combined sentiment of the thinking men in the nation. It can show them trends of thought and action. Correct interpretation of this can be made to yield great dividends in preventing costly errors of judgment on the part of the executives. The value of this is so great that it cannot be overlooked without serious loss.

Prospects at Denver Appear Good

JUST four years and a half ago the Denver Tramway was placed in the hands of Ernest Stenger as receiver. A plan of reorganization has been agreed upon and the receivership is about to be terminated. Not all the phases of the effort made to restore this system to its proper place can be covered in comment, but certain matters are of both practical and academic interest. The court's valuation of $23,514,769 for the lines within the city is less than the amount sought by the company, but it is greatly in excess of the bonds that will be outstanding after the new plan has been put into effect.

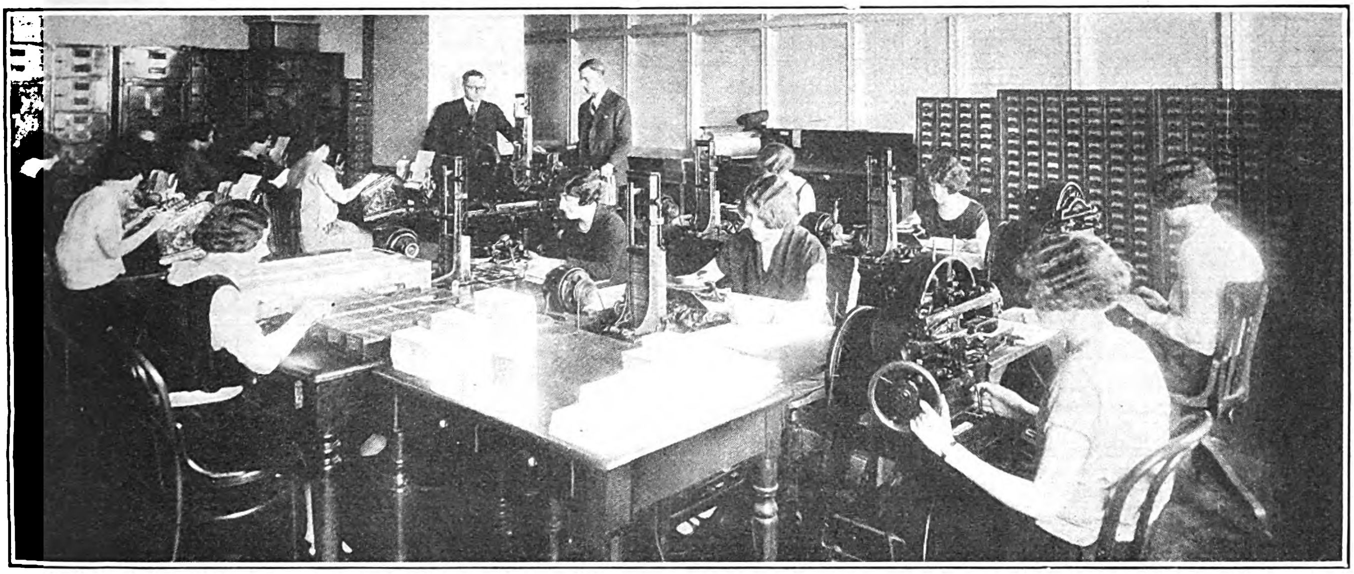
Underlying bonds to the amount of $4,635,000 will remain undisturbed in the reorganization. There has been no default on them. Funded debt will, however, be reduced from $17,421,700 to $11,078,350, with an adjustment of $3,953,337 arrears of interest, a total reduction of $10,296,687. Holders of bonds other than those undisturbed will receive one-half in new bonds and one-half in preferred stock, with preferred stock for all of the unpaid bond interest. The amount of the preferred stock will be $10,318,145. This preferred stock will be cumulative only to the extent of 5 per cent at all times, and the remaining 2 per cent is to be cumulative only when earned in any year but not paid. There will be 61,250 shares of no par common.

Annual charges will be reduced from $953,015 to $580,849 and annual sinking fund charges from $332,911 to $114,433. Of the bonds undisturbed 50 per cent mature in 1927, but a new mortagage will provide the means with which to pay or refund these issues. Cash in the hands of the receivers and payments required by stockholders will leave the company a balance of about $750,000 after payment of the expenses of the receivership. On the basis of an average net income of $1,295,767 for three years and total interest charges of $580,848 there will be available for sinking fund and dividends $714,920. Preferred stock dividends at 5 per cent will require only $523,407.

On the economic side of the matter, certain phases of the litigation between the city and the company are still before the courts on appeal of the city. The most important of these, perhaps, is the question of the duration of the franchise with its 5-cent fare provision. The master fixed a 7½ per cent return on the valuation found by him and held that the 6-cent fare sought to be enforced by the city was confiscatory. Long before this finding was handed down the court entered an interlocutory decree authorizing the receiver to charge not more than 8 cents for adults, with a 7½-cent ticket rate. The receiver has operated on this fare basis. Under it he has been able to put $2,750,000 back into the property out of earnings—an amount almost identical with the interest which has been defaulted on $12,883,859, par value, of bonds and notes. As for the franchise, the lower courts have held that the grants of 1885 and 1888 covering most of the lines are perpetual but that the rates sought to be imposed under them are confiscatory. Judged from both its financial and economic sides the outlook at Denver appears to be auspicious.

Preparing Transportation Department Payrolls by Machine

On the Boston Elevated Railway Time Cards Are Stamped by Automatic Addressographs at a Rate of 6,000 per Hour—Duplex Adding Machines Total Daily Figures and Transfer the Sum to Weekly Payrolls—Clerical Force Engaged on This Work Has Been Reduced and Errors Eliminated



Preparing Payrolls by Means of Automatic Addressograph and Duplex Adding Machines in the Office of the Boston Elevated Railway. Stencils Are Stored in the Filing Cases at the Right

LABOR-SAVING machinery has been adopted to an unusual extent by the Boston Elevated Railway to perform automatically many of the operations of making up payrolls for transportation department employees. As a result of the adoption of this system the men receive their pay several days sooner after the completion of the week's work than formerly was the case and the number of mistakes occurring in the preparation of payrolls has been reduced to a marked extent. The clerical force employed in the payroll department has been cut down from 40 to 27 and these employees now work five and one-half days a week instead of seven.

Adoption of the present method of preparing payrolls is the outgrowth of a series of events beginning in 1912. Prior to the organization of the trainmen's union in that year transportation department employees were paid a daily rate. After unionization a change was made to an hourly rate. The bureau of audit then arranged forms to be used under the new system.

Methods of using these forms, however, differed widely on the various divisions of the property. In 1914 the work of standardizing the preparation of payroll forms was undertaken. This progressed slowly on account of the many minor variations in practice at the different carhouses. Completion of this work required about two years and was scarcely accomplished before the time came for renewal of the agreement between the railway and the union. Negotiations to this end were begun in May, 1916, but were not concluded until August of that year. At that time additional changes were made in connection with wages of trainmen and this necessitated alteration in the method of making up payrolls.

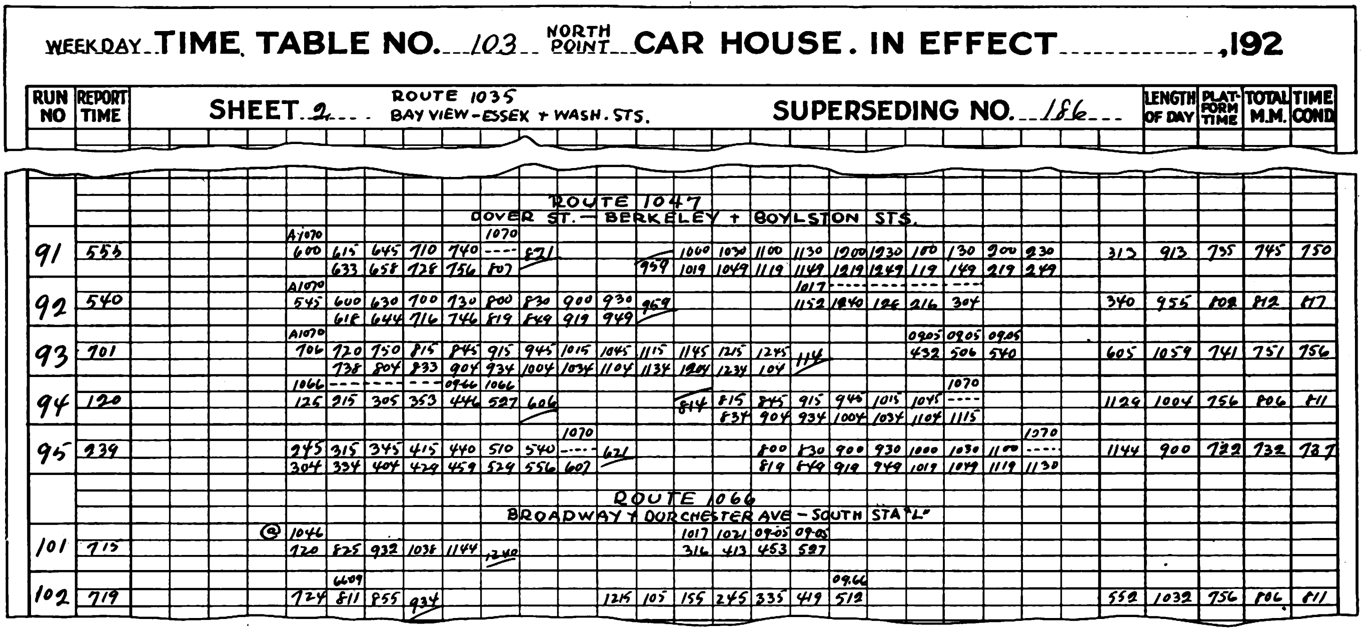
Representatives of the company, of whom E. H. Chandler, now supervisor of payrolls, was one, made an extended trip across the continent to study the methods employed by different railways in making up payrolls. Twenty-seven properties were visited. Because conditions in Boston differed somewhat from those found elsewhere, certain modifications of the methods in vogue on other railways seemed desirable. A conference was called by J. H. Moran, general auditor, and the problem thoroughly discussed. As a result of this conference the present plan was adopted in 1917 and no changes of any importance have been made to it since that time.

The cornerstone of the system of preparing payrolls is naturally the time-table. In Boston all runs from a single carhouse are listed on the same time-table. Crews operate cars on more than one line during the course of a day's work when schedule making requires such an arrangement. The type of time-table used is shown in an accompanying illustration. From this it will be seen that crews which operate cars on route No. 1047 throughout most of the day make occasional trips on route No. 1070. By this means it is possible to regulate the number of cars in service to the traffic demands at any particular hour and also to arrange the day's work in accordance with the agreement with the men. Eight hours is the regular length of a run, 60 per cent of which must finish within eleven hours and the remaining 40 per cent within fourteen hours.

Prior to 1920 time-tables were so made up that there

were a large number of extra men who received a minimum daily wage. In 1920, however, "additional" runs not counted in the percentages mentioned above were created, with short morning and night pieces and "cover time" between. Besides these "additional" runs there are still certain extra or "cover" men who receive a minimum eight-hour daily wage, but their number is much less than before. Time-tables are prepared subject to these conditions and the total time of motormen and conductors is listed in the manner shown.

An addressograph stencil is then prepared showing in the first line the employee's badge number, his name and his rate of pay. The latter item depends upon length of service. The second and third lines show the time on and off as well as the total hours and minutes spread time. This information is stamped by an automatic addressograph machine on a card of the type shown in an accompanying illustration. A card of this type is prepared for every man every day and sent to the carhouse in advance of the date required. Saturday and Sunday schedules differ materially from weekday schedules and separate addressograph stencils are prepared for them. No cards are prepared in advance for holidays because the amount of service to be operated cannot be foretold accurately in advance, depending as it does almost entirely upon the weather.



WEEKDAY TIME TABLE NO. 103 NORTH POINT CAR HOUSE. IN EFFECT ...., 192

RUN NO	REPORT TIME			SHEET 2				ROUTE 1035 BAY VIEW-ESSEX + WASH. STS.											SUPERSEDING NO. 186									LENGTH OF DAY	PLAT-FORM TIME	TOTAL M.M.	TIME COND
												ROUTE 1047																			
										DOVER ST. — BERKELEY + BOYLSTON STS.																					
						A1070					1070																				
91	555					600	615	645	710	740	----	821				1000	1030	1100	1130	1200	1230	100	130	900	230		313	913	735	745	750
							633	658	728	756	807				959	1019	1049	1119	1149	1219	1249	119	149	219	249						
						A1070													1017	----	----	---	---								
92	540					545	600	630	700	730	800	830	900	930	959				1152	1240	126	216	304				340	955	802	812	817
							618	644	716	746	819	849	919	949																	
						A1070																0905	0905	0905							
93	701					706	720	750	815	845	915	945	1015	1045	1115	1145	1215	1245	114			432	506	540			605	1059	741	751	756
							738	804	833	904	934	1004	1034	1104	1134	1204	1234	104													
						1066	----	----	---	0966	1066												1070								
94	120					125	215	305	353	446	527	606				814	815	845	915	945	1015	1045	----				1129	1004	756	806	811
																	834	904	934	1004	1034	1104	1115								
													1070												1070						
95	239					245	315	345	415	440	510	540	----	621				800	830	900	930	1000	1030	1100	----		1144	900	722	732	737
						304	334	404	429	459	529	556	607					819	849	919	949	1019	1049	1119	1130						
														ROUTE 1066																	
											BROADWAY + DORCHESTER AVE — SOUTH STA "L"																				
					@	1046										1017	1021	09-05	09-05												
101	715					720	825	932	1038	1144	1240					316	413	453	527												
							6609													09.66											
102	719					724	811	855	934					1215	105	155	245	335	419	512							552	1032	756	806	811

Typical Time-Table Used by the Boston Elevated Railway

Space is provided on the daily time card for notations concerning any changes from the regular routine of work. If no such change occurs, however, the time clerk at the carhouse needs only to initial the card as being correct. Every morning the cards for the previous day are sent in to the payroll office. No addressograph stencils are used for the cover men because the character of their work and their hours vary so greatly from day to day. To aid the payroll department in giving proper time credit the carhouse makes up a sheet listing the work of cover men.

Duplex adding machines are used to sum up hours and pay shown on the seven daily cards which represent a week's work. The tape of the adding machine is retained in the office as a permanent record and the total is transferred to the weekly payroll. For this purpose a form is used as shown in an accompanying illustration.

In preparing the payroll sheets the same stencils are used as for making out the daily time cards except that a guard is slipped over the lower portion of each stencil, and the time on and time off is, therefore, not printed. Stamping of the daily cards is done at the rate of 6,000 per hour. As there are some 4,000 platform men and 1,000 station and other miscellaneous transportation employees 35,000 cards per week are used.

Three stencils are used for each man, one for weekdays, one for Saturdays and one for Sundays. These are stored in filing cases, as shown in the accompanying illustration of the room where the preparation of the cards is done. The labor turnover on the Boston Elevated Railway, however, is comparatively small, being only 4 per cent in 1924, and the stencils are useful for a considerable time. According to agreement with the union, however, runs are picked every three months and that usually necessitates the preparation of a new stencil. Moreover, schedules are frequently changed in between the dates of picking runs. This also may necessitate changes in the stencils.

When a new time-table goes into effect each carhouse prepares and sends in to the payroll department a form known as a run guide, showing the number of the run which each man has picked for weekdays, Saturdays, Sundays and holidays. In addition to this a report is made each week showing the additional names placed on the payroll, changes in classification, rate of wages, etc., or the names of employees dropped from the payroll.

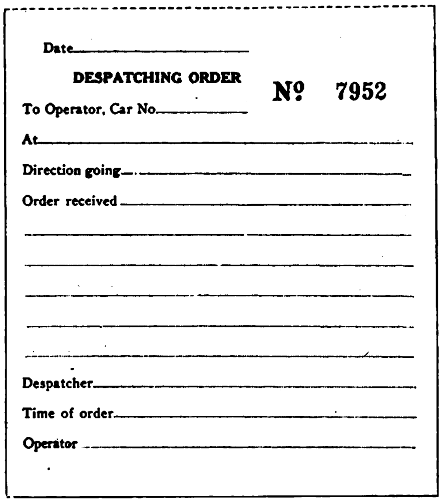
Despite the large number of calculations required in the preparation of payrolls very few errors are made. There are three calculations per card and more than 100,000 calculations per week. Mistakes, however, average only about 75 for each weekly payroll. From the payroll office the cards go to the auditor's office and are there checked up. Only about five mistakes per week escape detection by the bureau of audit.

A somewhat serious problem is created by the rapidity with which these cards accumulate. It is the practice to keep the cards for seven years. Those for the preceding three or four weeks are kept on hand in the payroll office and after that time they are sent to the storeroom, where they remain available if needed.

Telephone Dispatching on Shore Line Railway

A Duplicate Train Order Is Carried Under a Clip on the Vestibule Window Post in Full View of the Operator

WHEN the New Haven & Shore Line Railway was rehabilitated in 1923 and operation was resumed under the present management after a four-year cessation, there were no signals on the property, its predecessor company having preferred to use telephone dispatching. Not wishing to make a large outlay to install signal equipment the new management decided to continue the telephone dispatching system, but several important changes have been made in it. This railway operates a 34-mile single-track line between New Haven and Saybrook. The run is made in two hours, and as the headway is one hour under normal conditions there are four cars on the road.



Date

DESPATCHING ORDER

Nº 7952

To Operator, Car No.

At

Direction going

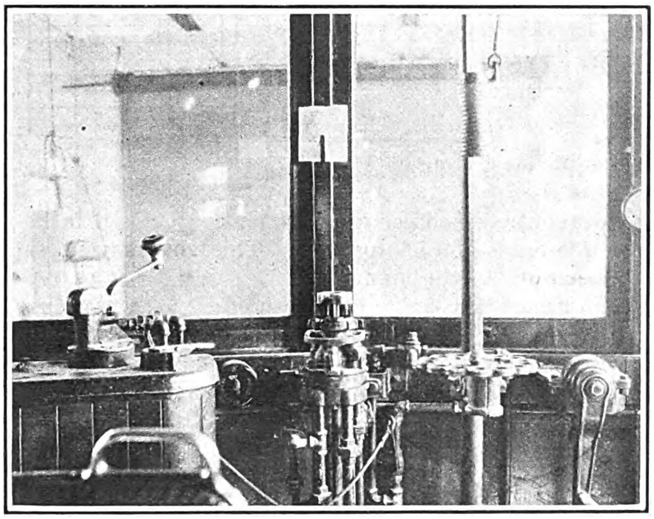
Order received

Despatcher

Time of order

Operator

Dispatching Order Form Used by Shore Line Railway



Dispatching Orders Are Attached to the Front Vestibule Window Post Directly in Front of the Operator

Fourteen turnouts are located along the line averaging about 2½ miles apart. The schedule calls for positive meets at Guilford, the mid-point of the line, and at turnouts between that point and the two ends of the line. Headquarters of the railway are now located at Guilford instead of at Saybrook as was the case formerly. All turnouts are connected by telephone with the dispatcher's office at Guilford. When cars are on time no calls are made excepting when the day operator is relieved. It is a standing order that relief operators report to the despatcher before commencing their runs. In case of trouble they telephone from the nearest instrument.

A daily dispatcher's report of the kind shown in an accompanying illustration is used. Each telephone booth is equipped with a pad of dispatching orders which are written out by the operator when he receives his instructions from the dispatcher. The wording of the dispatching order follows the wording of the dispatcher's report, which is written during the telephone conversation.

Duplicating pads are used at the telephone stations. The original order is then slipped under a clip on the left-hand front vestibule window post where it is directly in front of the operator until executed. A pink carbon copy is dropped into a locked box in the telephone booth. Under this arrangement the dispatcher's report, the operator's order and the carbon copy should agree in every detail. In case of any confusion as to the meaning of orders it is possible accurately to trace the responsibility.

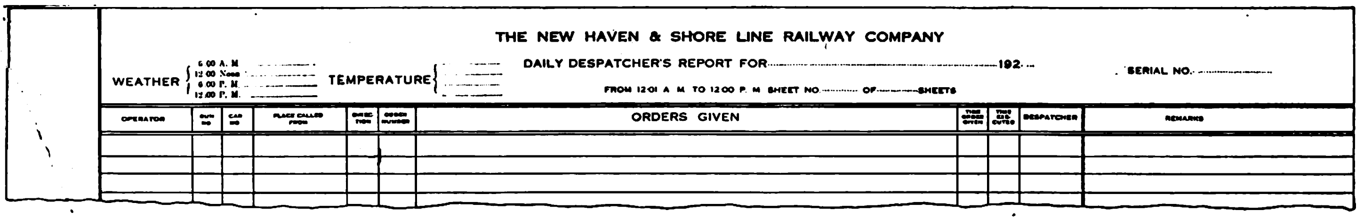
Trainmen Talk Safety to Passengers

SAFETY EDUCATION WEEK was observed in Nashville, Tenn., from May 3 to 9. The Nashville Railway & Light Company, feeling it to be the company's civic duty to assist in this movement and also recognizing the opportunity afforded to further good will and bring about a closer friendly relationship with its patrons, trained seven car operators to deliver four-minute talks on its cars.

The training of the platform employees extended over a period of ten days previous to the opening of Safety Education Week. On Monday morning, May 4, these operators boarded cars during the rush hours from 6 to 9 a.m. and 3 to 6 p.m., and delivered the talks from the front platform. The talks were so scheduled during the week that a speaker addressed the passengers on every car operated during the peak periods of riding in the morning and afternoon.

The Nashville Railway & Light Company operates a maximum of 146 cars and transports approximately 35,000 passengers during the rush-hour period. By dividing the system into divisions, the speakers boarded cars on four routes during the morning rush hours and on four other routes during the evening rush hours each day. In this way, practically every patron was reached by at least one talk during the week.

Speakers on practically every car were applauded and many passengers shook hands with the speakers and complimented them at the close of their addresses. Favorable newspaper comment was also received.



THE NEW HAVEN & SHORE LINE RAILWAY COMPANY

WEATHER 6.00 A. M. / 12.00 Noon / 6.00 P. M. / 12.00 P. M.

TEMPERATURE

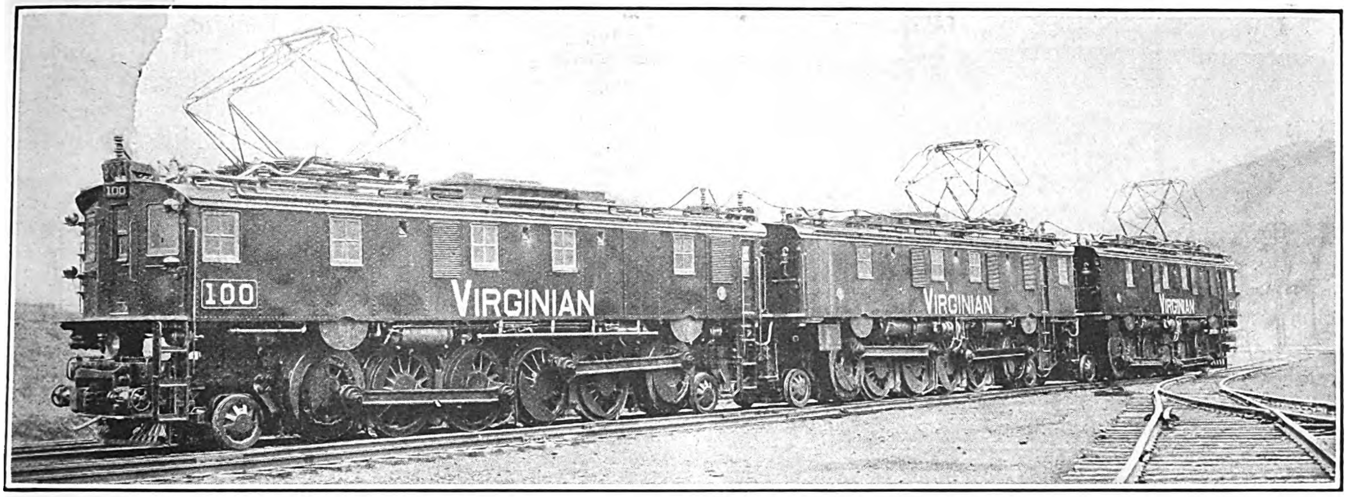
DAILY DESPATCHER'S REPORT FOR 192

FROM 12.01 A. M. TO 12.00 P. M. SHEET NO. OF SHEETS

SERIAL NO.

OPERATOR	RUN NO.	CAR NO.	PLACE CALLED FROM	DIREC-TION	ORDER NUMBER	ORDERS GIVEN	TIME ORDER GIVEN	TIME EXE-CUTED	DESPATCHER	REMARKS

The Wording of the Dispatcher's Report Form Is Identical with That of the Order Written Down by the Car Operator



Three Motive-Power Units Are Coupled Together Semi-Permanently to Form the Largest Locomotive in the World

Economies Expected from Electrification of Virginian Railway

Largest Locomotives in the World, Equipped with Split-Phase, Constant-Speed Electric Motors, Will Haul Heavy Coal Trains Over Severe Mountain Grades—Automatic Renegeration Is Provided—Electric Operation on 133 Route-Miles Will Be Inaugurated This Year

ELECTRIFICATION of the Virginian Railway from Mullens, W. Va., to Roanoke, Va., is progressing steadily and it is expected that electric operation of this section will be inaugurated before the end of 1925. About 133 route-miles or some 213 track-miles will be included in the undertaking, the cost of which will be about $15,000,000 as outlined in ELECTRIC RAILWAY JOURNAL for May 5, 1923, page 777. Substitution of powerful electric locomotives in place of the present steam locomotives is expected to result in important operating economies.

The Virginian Railway was built for the sole purpose of moving coal from the New River and Pocahontas fields to tidewater at Norfolk. Heavy rolling stock and long trains have always been characteristic of its operation. The part of the road which is being electrified has offered particularly difficult operating problems because of the heavy grades. East of Roanoke the grades are easy and the movement of trains on this part of the road has never presented serious difficulties.

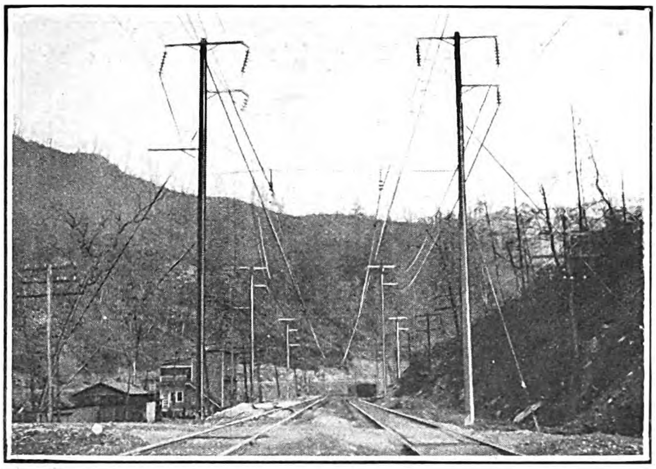
Nearly all of the Virginian coal tonnage originates west of Elmore. At present, trains of approximately 5,500 gross trailing tons are made up in the yard between Mullens and Elmore and are moved up the 2 per cent grade between Elmore and Clark's Gap by means of a road engine and two pushers. The combined weight of the locomotives in this train, including their tenders, is approximately 1,270 tons, and their combined tractive effort rating is 409,400 lb. From Clark's Gap the 5,500-ton train is taken into Princeton with the single road engine. Princeton is a terminal point under steam operation and trains of 8,000 trailing tons are operated from there to Roanoke with one road engine, two switchers to start out of the yard and a pusher up the grade between Whitehorne and Merrimac.

Under electric operation coal trains will be made up in the Mullens-Elmore yard with an electric road engine at the head end of the train and a similar pusher at the rear end. These will handle 6,000 gross tons from Elmore to Clark's Gap. The speed will be 14 m.p.h., which is at least double that obtained at present with steam. At Clark's Gap the train will be increased 50 per cent to 9,000 tons, and one electric locomotive will take it from there to Roanoke. It will not be necessary to use pushers out of Princeton nor up the Whitehorne grade.

Westbound trains will consist almost entirely of empty coal cars and will be handled with one road locomotive at a speed of 28 m.p.h. except from Fagg to Merrimac,

SPECIFICATIONS OF VIRGINIAN LOCOMOTIVE UNIT

Total weight of unit	425,300 lb.
Classification of wheels	2-8-2
Weight on drivers	309,300 lb.
Number of driving axles	4
Number of idle truck axles	2
Capacity at one-hour rating	2,030 hp., 14.1 m.p.h. 2,375 hp., 28.3 m.p.h.
Starting tractive effort at 25 per cent adhesion	77,325 lb.
Maximum starting tractive effort at 29.9 per cent adhesion	92,500 lb.
Tractive effort—hourly rating	54,000 lb. 14.1 m.p.h. 31,500 lb., 28.3 m.p.h.
Speed—hourly rating	14.1 m.p.h., 28.3 m.p.h.
Tractive effort—continuous rating	45,000 lb., 14.2 m.p.h. 26,250 lb., 28.4 m.p.h.
Speed—continuous rating	14.2 m.p.h., 28.4 m.p.h.
Maximum speed	38 m.p.h.
Total wheelbase	37 ft. 6 in.
Rigid wheelbase	16 ft. 6 in.
Length over all (between pulling faces of coupler knuckles)	50 ft., 9 in.
Width over all	11 ft., ¾ in.
Height from rail to locked position of pantograph	16 ft., 0 in.
Diameter of driving wheels	62 in.
Diameter of idle truck wheels	33 in.
Voltage and type of contact line	11,000 or 22,000-volt, single-phase overhead
Number and type of motors	Two type 452-A
Method of drive	Flexible gears, jackshaft and siderods
Gear ratio	21:100
Type of control	Electro-pneumatic (HB)



Typical 11,000-Volt, Single-Phase Overhead Line Construction

from Kellysville to Princeton, and from Rock to Elmore. The weight of these trains will be about 2,800 tons.

To haul these heavy trains over the severe mountain grades the largest locomotives in the world will be used. Each of these consists of three semi-permanently coupled motive-power units. Thirty-six units, or twelve complete locomotives, are being built by the Westinghouse Electric & Manufacturing Company. These are of the split-phase constant-speed type. Current is taken from the 11,000-volt overhead wire through a pantograph to the main transformer. Single-phase power is changed into three-phase power by the main transformer and a rotating phase converter, whence it is fed to the motors. The latter are induction motors arranged for two comparatively constant running speeds of 14 and 28 m.p.h.

Acceleration to the running speeds is obtained by varying the resistance in the secondary circuit of the motors, a liquid rheostat being provided for this purpose. The amount of resistance is determined by the height of the electrolyte in the rheostat, and this is directly controlled by the engineman through the master controller. The master controller essentially consists of two parts, a speed drum for changing the motor connections to secure the desired running speed, and an acceleration drum. An auxiliary controller is provided in which are placed switches for operating the pantograph, buttons for independent operation of the different rheostats, and a button for tripping the circuit breakers.

An interesting feature of these locomotives is the oil-insulated, force-cooled transformer. Oil is continuously circulated through a special radiator by a motor-driven centrifugal pump, and air for the radiator is supplied by a blower driven by the same motor which drives the pump. By using this type of transformer, the advantages of the oil-insulated transformer are secured without the space required by the self-cooled type.

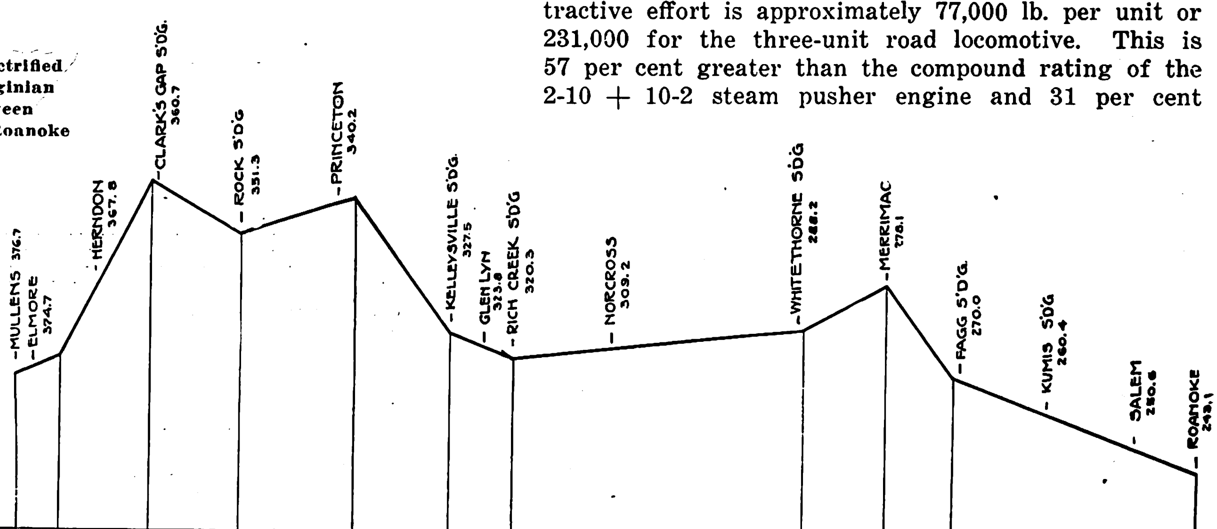
The locomotives are automatically regenerative. When descending a grade of such degree that the net tractive effort becomes negative, the motors become generators and return power to the line. Thus, it is necessary to use the air brakes only to bring the train to a complete stop. This results in no inconsiderable saving in brakeshoes and brake rigging maintenance.

While the motive-power units will at first normally be used in groups of three as road locomotives, the control, which is of the electro-pneumatic type, is arranged to permit the operation of four cabs together. Thus future traffic conditions are amply provided for, both from the standpoint of power supply and locomotive capacity.

Each motive power unit has the Mikado or 2-8-2 wheel arrangement, the weight per cab being approximately 425,000 lb., so that the weight of the three-cab road engine is 637.5 tons. Each driving motor has mounted at each end of the shaft a pinion which meshes with a flexible gear, and the gears are mounted on a jack shaft, the power being transmitted from the gear centers to the drive wheels by means of side rods.

Maximum tractive effort of each motive-power unit as limited by electrical capacity is 92,500 lb., which occurs at an adhesion slightly under 30 per cent. At the conservative starting adhesion of 25 per cent the tractive effort is approximately 77,000 lb. per unit or 231,000 for the three-unit road locomotive. This is 57 per cent greater than the compound rating of the 2-10 + 10-2 steam pusher engine and 31 per cent

Profile of Electrified Section of Virginian Railway Between Mullens and Roanoke



MILES *	506	10.32	10.05	12.97	10.90	7.21	32.72	9.51	7.43	27.56
ELEVATION 1427.73	1528.42	2525.97	[illegible]	2458.16	1674.15	1534.95	[illegible]	1966.37	1145.06	926.0
COMPENSATED GRADE PER. CENT. EAST	+.531	+1.979	- 396	+.402	-1.259	-.340	+.168	+.583	-1.252	-.313
COMPENSATED GRADE PER. CENT. WEST	-.228	- 1.681	+ 710	- 198	+1.395	+.391	-.024	- .475	+1.400	+.401
MAXIMUM GRADE %	1.21	2.11	1.25	0.60	1.50	0.808	0.20	0.60	1.5	0.9
AVER. CURVE Deg	3.79	3.73	3.93	2.55	1.70	0.64	1.80	1.35	1.85	1.10
MAX. CURVE Deg	12°	12°	12°	8°	8°-10'	3°	8°	8°	8°	8°
MILES from NORFOLK (from Mile Posts) 376.73	371.67	361.36	351.33	338.49	327.49	320.29	297.52	278.10	270.67	243.11

* SURVEY EQUATIONS INCLUDED

greater than the simple rating. The continuous tractive effort of the three-cab locomotive is 135,000 lb. at 14.2 m.p.h. and 78,800 at 28.4 m.p.h.

Power for the electrification will be supplied from a power plant being constructed at Narrows, Va. From this new station power will be fed both ways on 88,000-volt transmission lines and from these lines to the overhead catenary system by means of transformer stations located along the right-of-way. To provide for the application of greater power to trains with growth of traffic the transformer stations, trolley line, and locomotives have been designed for a voltage of either 11,000 or 22,000.

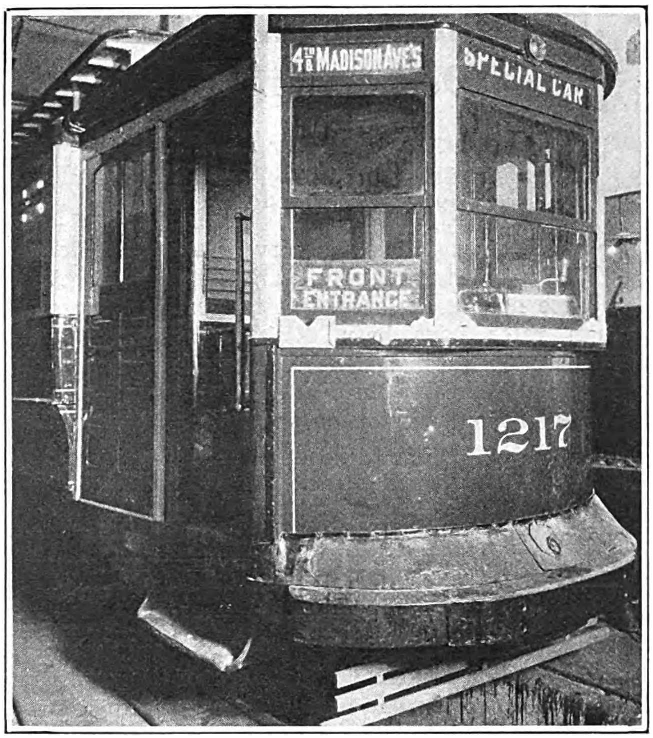
The principal savings due to electrification will be reduced maintenance of equipment costs and the transportation expense. A considerable reduction in each of these accounts is expected. The cost of maintaining steam locomotives, of the type used by the Virginian, is heavy on account of expensive boiler and firebox repairs which cannot be avoided. Electric locomotives have no similar inherent maintenance expense.

Costs of electric energy for the trains will be less than the cost of coal for steam locomotives. This is due to the more efficient burning of the coal in the power house and to the absence of large standby losses, which are of necessity a part of steam locomotive operation. This reduction in energy cost, however, is offset by the maintenance and depreciation of the transmission and distribution system.

Using Sign Lights to Illuminate Fare Box

SOME of the cars used by the New York & Harlem Railroad, New York, N. Y., are arranged for either one-man or two-man operation. When used on one-man cars the fare box is located against the front end just to the right of the entrance. An illuminated sign is displayed in the lower right-hand window. In one-man operation the sign reads "Front Entrance," and when operated by two men the sign is changed to "Enter at the Rear."

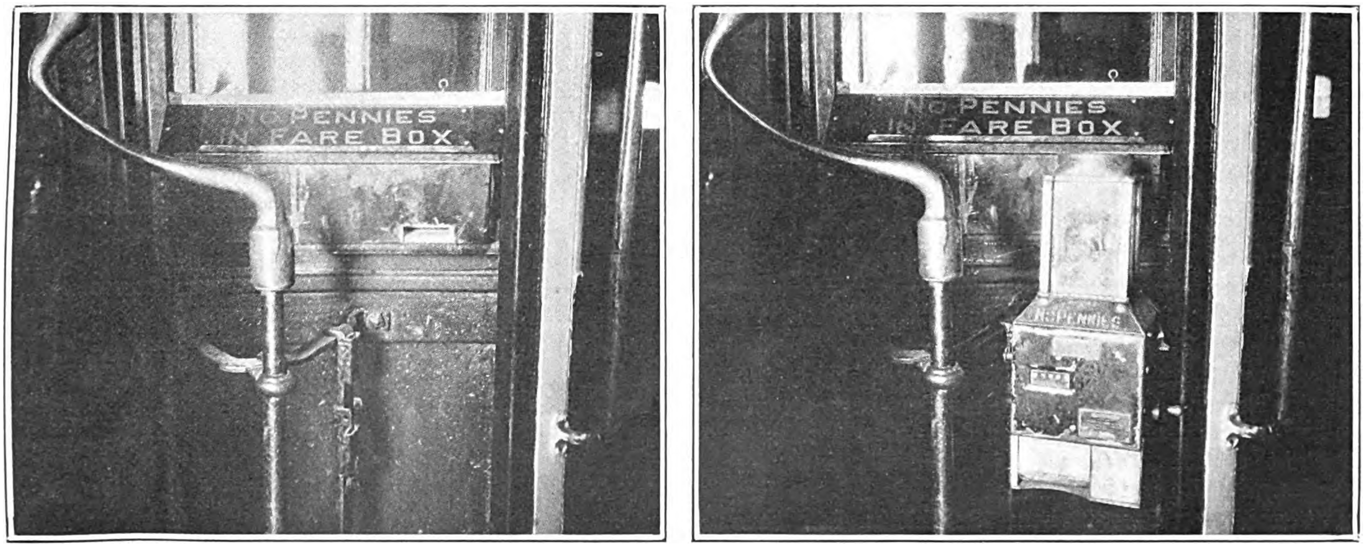
By locating the fare box near this illuminated sign the same lamp that is used for the sign lighting illuminates the fare box. A slot has been cut in the box which incloses the sign, and the fare box is installed so that the lower edge of the top is just above this slot. The light from the lamp in the sign box passes through the opening and illuminates the change tray in the fare box. An accompanying illustration shows the hole in the sign box and the fare box in position.



An Illuminated Sign Is Used in the Lower Right-Hand Window to Indicate that Entrance Is at the Front

---

The Chicago Surface Lines, Chicago, Ill., adopted a new and distinctive headgear for supervisors to increase their utility to the public. Flare caps, resembling those of the traffic policemen alongside whom they work, have replaced the regulation company hats. A big number shield like that worn by members of the police department spreads across the front. The supervisors have become noticeable figures with a big part to play in expediting loading and offering solicitous attention to patrons.



At Left, a Slot at the Bottom of the Box for the Illuminated Sign Permits Light to Pass Through to Illuminate the Fare Box. At Right, Fare Box in Position Illuminated from Lamp in Sign Box

Interline Freight Traffic Development

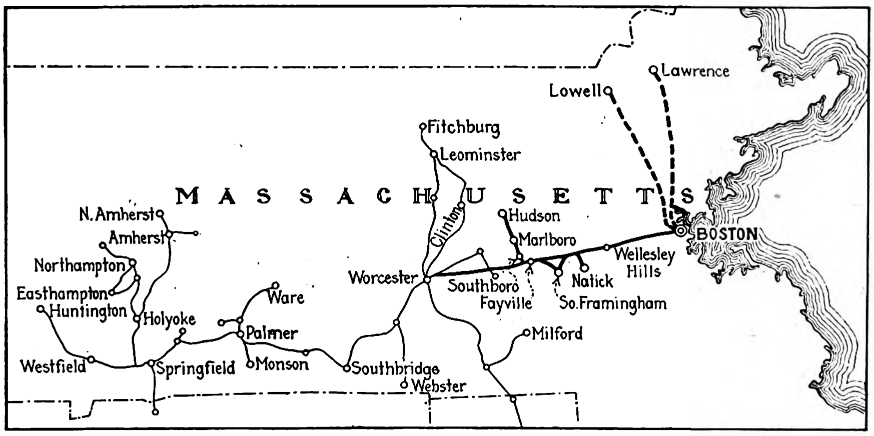
Overnight Delivery Is Made to All Points Between Springfield and Boston—Motor Trucks Are Used for Pick Up and Delivery

FREIGHT business has been developed by the Boston & Worcester Street Railway until the revenue from this source now forms a substantial part of the gross. Through rates have been established from Lowell, Lawrence and Boston on the east to all points on the Boston and Worcester lines as well as to Springfield, Holyoke and Northampton on the west. Participating in this joint service are the Worcester Consolidated Street Railway, the Springfield Street Railway, the Fitchburg & Leominster Street Railway, the Holyoke Street Railway and the Northampton Street Railway.

It was not until 1913 that freight service was inaugurated by the Boston & Worcester, although passenger service had been established several years before. At the beginning only four cars were used, whereas the railway now has 22 freight cars of its own and the cars of other carriers are used also to some extent in interchange service.

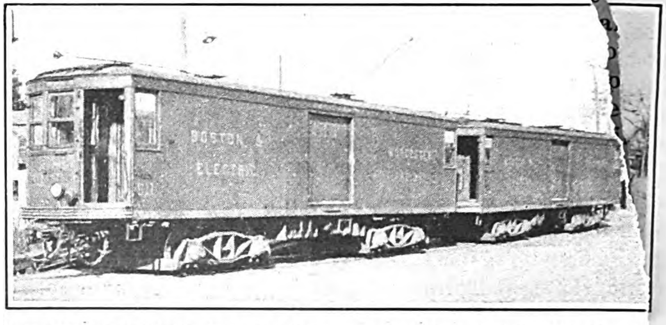
TABLE OF CLASS RATES FROM BOSTON IN CENTS PER 100 LB.

Rate Reference Number	Classes 1	2	3	4	5	6	Rule 25	Rule 26
6	45	37	32	25	20	20	32	26
7	50	41	33	25	20	20	36	27
8	50	43	34	25	20	20	36	27
9	50	43	36	27	23	23	37	29
10	51	44	36	27	23	23	39	29
11	53	44	36	27	24	24	39	29
12	54	46	36	27	25	25	39	29
13	56	47	37	28	25	25	40	30
14	56	47	37	29	25	25	41	30
15	57	49	38	29	25	25	41	31
16	58	49	39	29	25	25	42	31
17	58	50	39	29	28	28	42	31
18	59	50	40	30	28	28	43	32



Area of Central and Eastern Massachusetts Covered by Interline Freight Service

Rolling stock consists of fourteen motor cars and eight trailers. These are 45 ft. long and are equipped with automatic air brakes and Brill arch-bar freight trucks. The motor cars have multiple-unit control. Two-car freight trains are operated.



Two-Car Freight Trains of This Type Are Operated by the Boston & Worcester in Conjunction with Five Other Electric Railways in Massachusetts

Freight stations are maintained in all important towns between Boston and Worcester. Cars leave Boston at noon for Framingham, Southboro, Marlboro, Hudson and Worcester. Other cars leave at 6 p.m. for those points and also for Wellesley Hills, Natick, Fayville, Westboro and Shrewsbury. Eastbound cars leave Worcester at 2 p.m. and at 5 p.m. Possession of a double-track line all the way from Boston to Worcester makes it possible to operate freight service independently of the passenger schedule. Motor trucks operate out of Boston to serve Lowell and Lawrence.

Shipments from points on the Boston & Worcester lines are accepted only to points within the state of Massachusetts and vice versa. Freight received at the terminal in Boston at 5:30 p.m. is delivered to all points on the lines of the company and also in Springfield by 7 a.m. In Holyoke and Northampton delivery is made before 10 a.m. Two general methods are followed in making shipments, station to station and pick-up and delivery. An arrangement has been made with local trucking companies to assist with the latter class of business.

Charges are based on the kind of material handled and on the distance. A minimum charge of 50 cents is made. The general scheme followed is shown in the accompanying table. Rate reference numbers refer to the zone in which the point of delivery is located and class numbers to the character of the material.

Westbound from Boston the railway has an average of 25 carloads of freight per day. Miscellaneous local freight constitutes the bulk of the business. Some carload lots of barreled sugar are carried. Shoes are shipped in large quantities from the manufacturing towns of Marlboro and Hudson. Much leather is also carried inbound to those towns. It is the practice also to spot cars for local express companies, the latter loading and sealing the cars. Eastbound the traffic is somewhat lighter than westbound.

Freight traffic on the Boston & Worcester increased every year from 1913 up to 1924. Last year a slight decline occurred due to the general business depression in this district. Now, however, the traffic shows signs of picking up again.

Unregulated motor truck competition has been injurious to the freight business of the electric railways in Massachusetts. Had all of the traffic of this kind which has at various times been routed via the Boston & Worcester line been retained, the present volume would be double what it is. It is thought by the railway management that truck competition is not profitable to its operators. In support of this opinion is the rapidity with which these undertakings change ownership. Moreover, the trucks are comparatively lightly taxed. Public sentiment in favor of heavier taxation for motor truck freight carriers is increasing and it is hoped by the management that in the future the railways will be given better protection.

New Traffic Regulations Aid Railway Operation in Pittsburgh

Elimination of Parking on Nearly All of the Streets Where Cars Operate in the Congested District Has Speeded Up Service — Construction of a Half-Mile Extension Will Make Possible Still Further Improvement Through Rerouting—Co-operation of the Public Was Instrumental in Securing Adoption of the New Plan

PROHIBITION of parking alongside of railway tracks in the downtown business section of Pittsburgh has effected a notable improvement in transportation service. The present regulations governing the matter of parking are strict, and they are rigorously enforced. Nevertheless there has been but little objection raised against them. This is largely because the Pittsburgh Railways secured the indorsement of all the more important civic bodies before the plan was put into effect.

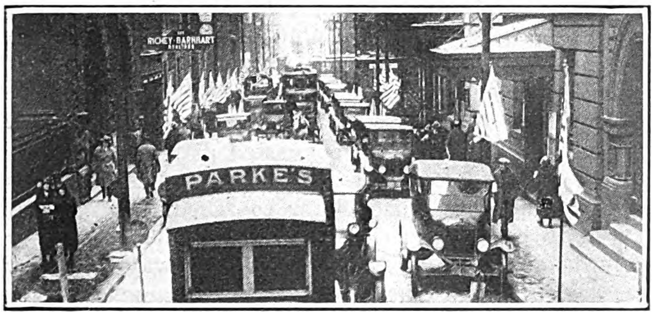
Prior to the adoption of the no-parking plan, a short-looping scheme for street cars had been proposed by the company, as told in ELECTRIC RAILWAY JOURNAL for Nov. 22, 1924, page 899. It was pointed out by the management that there had been but three major changes in the street locations and widths in the Golden Triangle, as the congested district in Pittsburgh is known, since the first horse car was operated in 1859. At that time the city had a population of 77,000. The present population of the city is nearly ten times that number.

The Golden Triangle has an area of only 218 acres, of which 63 acres or approximately 30 per cent are utilized for streets and alleys. Into the narrow confines of this area is poured every day a tremendous volume of vehicular traffic. A check taken in 1917 showed 47,321 vehicles entering and leaving the Triangle daily, not including street cars. A similar check in 1920 showed 60,519 vehicles, an increase of 25.6 per cent. In December, 1923, a similar check showed 82,840 vehicles, an increase of 33 per cent. Figures for 1923 showed a growth of 74 per cent over those for 1917.

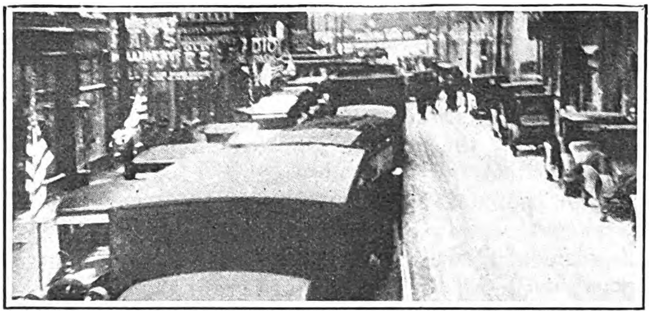
Eight years ago the maximum number of vehicles remaining or parking in the Triangle at any one time was approximately 2,500. By 1923 it had reached 6,656, an increase of 166 per cent. Just prior to the enactment of the new regulations the number was even larger.

Besides the increasing number of vehicles entering this area every day the major causes of congestion were the narrowness of the streets, bad street intersections (the Triangle has comparatively few streets running straight through and many intersect at angles, making the flow of traffic difficult), parking of commercial and pleasure automobiles, and the number of vehicles and streets cars making left-hand turns.

The situation had reached a point where it was a menace to the future of downtown Pittsburgh. Although the ultimate remedy was thought to be the establishment of a rapid transit system, it was desired to take some preliminary steps to relieve congestion until such facilities could be provided. Two temporary measures were suggested as possible methods of relieving conditions. These alternatives were, first, the prohibition of parking within the congested area, or second, the removal of street cars from that district.



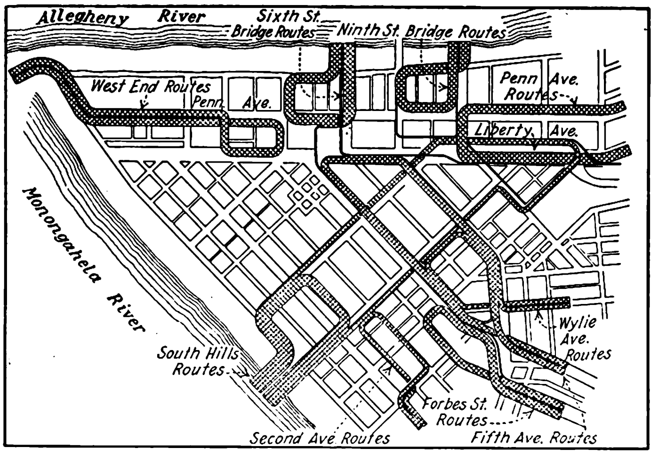
On Narrow Streets Traffic Movement Was Seriously Impeded by Lack of Adequate Regulations



When Parking Was Permitted All Moving Traffic Used the Car Tracks

It was to accomplish the second of these objects that the Pittsburgh Railways suggested the short looping plan. This would have created seven major and two minor loops for street cars in the Golden Triangle. In only two instances would there have been overlapping of important loops in a way that might have caused traffic congestion. The various loops were scattered along the outer edge of the congested district as shown on the accompanying map. From an operating point of view this routing possessed several important advantages. On the other hand, many persons going downtown would have been obliged to walk several blocks to reach their ultimate destinations, and to walk the same distance to reach a street car when homeward bound.

Approval of this plan was granted by the Traction Conference Board on Jan. 31, 1924. Protests were made, however, by the Pittsburgh Real Estate Board, the Downtown Business Men's Association, the Retail Merchants Association, and the Water Street and Lower Downtown Triangle Improvement Association. Their objections were based on fear of losing business if the cars were relegated to the outskirts of the congested district. These bodies suggested certain modifications


Allegheny River
Sixth St. Bridge Routes
Ninth St. Bridge Routes
West End Routes
Penn Ave.
Penn Ave. Routes
Liberty Ave.
Monongahela River
South Hills Routes
Wylie Ave. Routes
Forbes St. Routes
Second Ave. Routes
Fifth Ave. Routes

Short-Looping Plan First Proposed by Pittsburgh Railways to Reduce Congestion in the Downtown District

in the plan and conferences were held between their representative and officials of the railway. As a result of numerous conferences of this kind a modified plan was prepared.

Four principal provisions were included in the amended plan. These were:

1. New traffic ordinances embodying no-parking regulations on the principal trolley streets in the downtown district.
2. A larger number of traffic officers to enforce the regulations.
3. Establishment of a new system of tagging automobiles for violation of the ordinance, and increasing the amount of the fine for repeated offences.
4. Franchise for the construction of a new single track on Diamond Street to complete a separate loop, and permit certain changes in car routes.

Agreement between the railway and the various associations on details of the modified plan was reached on Feb. 14, 1925. This was subsequently referred to and approved by the Traction Conference Board and the City Council. Approval for the stringent no-parking regulation was secured largely because the plan had the support of the various civic associations. It was the feeling of the railway that the modified plan was theoretically less well adapted to the needs of the situation than was the short-looping plan, but in its desire to co-operate with the mercantile interests, the company was willing to accept the modified plan.

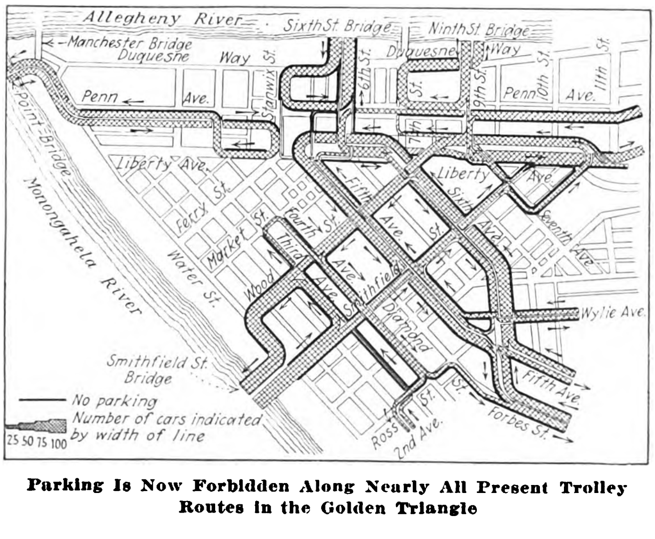
Under the new traffic regulations streets in the Golden Triangle are divided into three classifications. On Fifth and Oliver Avenues and on Sixth Street, all extremely heavily traveled thoroughfares, no parking is permitted at any time. On practically all other streets where the railway operates in the downtown district parking is forbidden between 8 a.m. and 6 p.m. Elsewhere one-hour parking is allowed. The relation between the no-parking streets and the car routes is shown on an accompanying map.

On certain one-way streets parking is permitted on the right-hand side. This, however, is not a handicap to the railway. As all such streets are rather narrow it is impossible for vehicles to pass standing street cars on the right, and no steady flow of traffic could be maintained on that side of the street. Parking, therefore, creates no interference with the flow of vehicles, which continues uninterrupted on the left-hand side of the street.

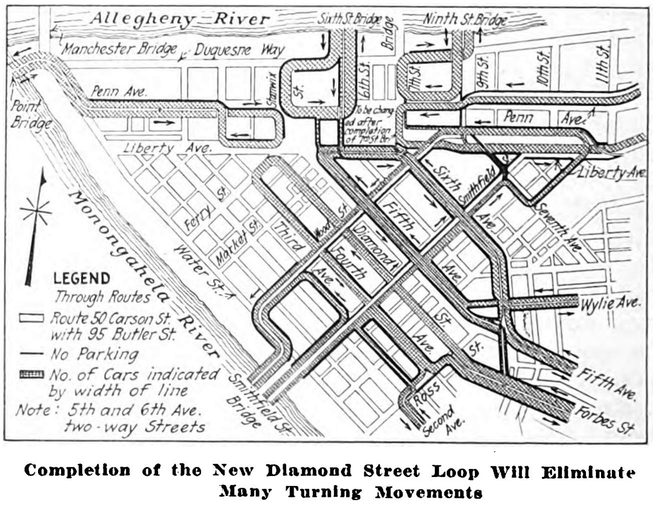
On all such streets where parking is permitted on one side only a space designated as a loading zone has been set aside on the parking side and plainly marked. These zones vary in length from 40 ft. to 100 ft., but in no case cover more than one-half of the entire length of the block. In this zone vehicles may stop only to pick up or discharge passengers or to load or unload merchandise. The latter operation is not allowed to consume more than twenty minutes.

From the railway point of view there is practically no difference between the elimination of parking between 8 a.m. and 6 p.m. and its total elimination, because serious congestion exists only during business hours. Since the passage of this ordinance the car running time through the congested districts has been reduced about 25 per cent. Moreover, it has been possible to keep cars much closer to schedule. Whereas it used to be the practice to turn back 50 or 60 cars every day in order to fill breaks in headway it is now necessary to turn back only two or three for this purpose.

Violation of the provisions of the new ordinance is punishable by a fine of $3 for the first offense, $4 for the second offense within a period of six months, $5 for the third offense and a fine ranging from $10 to $25 for the fourth offense within six months. Previously the fines were $1, $3, $5 and $10. Simultaneously with the passage of the new regulations the City Council authorized the addition of 125 patrolmen to the existing police force. A large part of these are used in traffic regulations.


Allegheny River
Sixth St. Bridge
Ninth St. Bridge
Manchester Bridge
Duquesne Way
Stanwix St.
6th St.
7th St.
9th St.
10th St.
11th St.
Penn Ave.
Point Bridge
Liberty Ave.
Fifth Ave.
Sixth St.
Seventh Ave.
Ferry St.
Market St.
Wood St.
Fourth Ave.
Third Ave.
Smithfield St.
Diamond
Wylie Ave.
Water St.
Monongahela River
Smithfield St. Bridge
Fifth Ave.
Forbes St.
Ross St.
2nd Ave.
No parking
Number of cars indicated by width of line
25 50 75 100

Parking Is Now Forbidden Along Nearly All Present Trolley Routes in the Golden Triangle


Allegheny River
Sixth St Bridge
Ninth St. Bridge
Manchester Bridge
Duquesne Way
Point Bridge
Penn Ave.
Stanwix St.
6th St.
7th St.
9th St.
10th St.
11th St.
To be changed after completion of 7th St. Br.
Liberty Ave.
Sixth Ave.
Smithfield St.
Seventh Ave.
Fifth Ave.
Ferry St.
Market St.
Wood St.
Third Ave.
Fourth Ave.
Diamond
Wylie Ave.
Water St.
Monongahela River
Smithfield St. Bridge
Ross
Second Ave.
Forbes St.
LEGEND
Through Routes
Route 50 Carson St. with 95 Butler St.
No Parking
No. of Cars indicated by width of line
Note: 5th and 6th Ave. two-way Streets

Completion of the New Diamond Street Loop Will Eliminate Many Turning Movements

Enforcement of the new ordinance has been strict, but there has been little complaint. The merchants who were instrumental in securing the adoption of the plan have given it their hearty support. The great majority of the people, being street car riders, are thoroughly in sympathy with it. Numerous commendatory letters have been received by the railway, telling how much more quickly it is possible to travel by trolley.

Retail trade in the Triangle has been slightly smaller in volume during the past few weeks than it was during the same period a year ago. Analysis of the situation has shown, however, that the decrease is not due to the no-parking regulations. Outside the area where these are operative, the falling off has been even more noticeable.

On March 23 the City Council approved a franchise for the construction of new track on Diamond Street. Work was commenced on this project on May 19. Its completion will permit certain changes in routing, as shown on an accompanying map, and reduce the number of crossing and turning movements in the congested district. When this has been accomplished the second important step will have been taken to relieve the situation in the downtown section, and it is expected that these arrangements will suffice for some years to come, or until some rapid transit system has been built to serve the city.

Passengers Helped to Find Their Way

MORE than 50,000 street car riders visited the St. Louis Zoological Gardens in Forest Park on Sunday, April 26. Once there they found that some thoughtful person had worked out a system of directing signs that carried visitors depending on street cars for transportation to the nearest car lines over the shortest and most direct route. Black and white signs, in keeping with the dignity of the gardens, were placed at convenient places indicating the routes to be taken to the cars. The name of the United Railways was not on the signs. The larger signs, placed at the bear pits, the monkey house and the pond of the sea lions, read:

"Follow the trail of arrows to the street cars."

Smaller signs with directing arrows read:

"To the street cars."

At the boulevard just to the south of the monkey cage many car patrons have wandered away from the direct route to the loading platform of the railway. There a neat sign read:

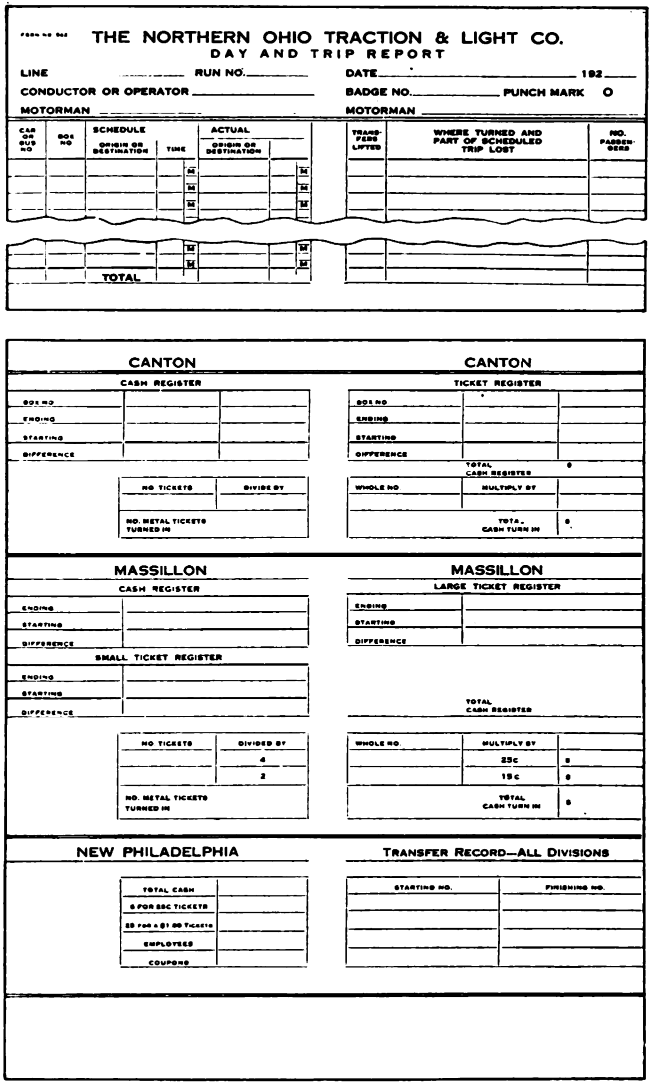
"Straight ahead across the boulevard to the street cars."

This sign is reinforced by a number of small arrow signs converging on the path directly across the boulevard to the cars.

The zoological gardens are the most popular part of Forest Park, but were considered out of the way for street car users. Officials of the railway recognized this condition and they established a loading loop immediately south of the gardens on the Market Street car line. A cinder path was built to the gardens with the consent of the Park Department officials. Apparently the public did not learn of this path, for park traffic department officers of the railway found that comparatively few patrons utilized the loading and unloading station. Thousands came out of the park far to the east and west of the station, and some were forced to walk back a quarter of a mile to get to the cars. Investigation revealed three old tin signs directing park visitors to the cars, but none of them was so placed that it directed the public to the path to be taken to the loading platform.

Uniform Trip Sheet for Cars and Buses

AFTER making a trial for some time of separate forms of trip sheets for cars and buses, the Northern Ohio Traction & Light Company, Akron, Ohio, recently adopted a day and trip report that is applicable to all cars and buses operated on the system. This form, a reproduction of which is shown herewith, is 8½ in. wide and 9¾ in. long, arranged to fold into the standard form of cover used by operators.



THE NORTHERN OHIO TRACTION & LIGHT CO.
DAY AND TRIP REPORT

LINE ________ RUN NO. ________ DATE ________ 192__
CONDUCTOR OR OPERATOR ________ BADGE NO. ________ PUNCH MARK O
MOTORMAN ________ MOTORMAN ________

CAR OR BUS NO	BOX NO	SCHEDULE ORIGIN OR DESTINATION	SCHEDULE TIME		ACTUAL ORIGIN OR DESTINATION				TRANSFERS LIFTED	WHERE TURNED AND PART OF SCHEDULED TRIP LOST	NO. PASSENGERS
				M			M				
				M			M				
				M			M				
				M			M				
				M			M				
		TOTAL									

CANTON — CASH REGISTER

BOX NO		
ENDING		
STARTING		
DIFFERENCE		

NO TICKETS	DIVIDE BY
NO. METAL TICKETS TURNED IN	

CANTON — TICKET REGISTER

BOX NO.		
ENDING		
STARTING		
DIFFERENCE		

TOTAL CASH REGISTER $

WHOLE NO.	MULTIPLY BY	
	TOTAL CASH TURN IN	$

MASSILLON — CASH REGISTER

ENDING	
STARTING	
DIFFERENCE	

SMALL TICKET REGISTER

ENDING	
STARTING	
DIFFERENCE	

NO. TICKETS	DIVIDED BY
	4
	2
NO. METAL TICKETS TURNED IN	

MASSILLON — LARGE TICKET REGISTER

ENDING	
STARTING	
DIFFERENCE	

TOTAL CASH REGISTER

WHOLE NO.	MULTIPLY BY	
	25c	$
	15c	$
	TOTAL CASH TURN IN	$

NEW PHILADELPHIA

TOTAL CASH	
6 FOR 85C TICKETS	
25 FOR A $1.00 TICKETS	
EMPLOYEES	
COUPONS	

TRANSFER RECORD—ALL DIVISIONS

STARTING NO.	FINISHING NO.

This Trip Sheet Is Used for Both Cars and Buses of the Northern Ohio Traction & Light Company

On the front spaces are provided for recording line, run number, date, name and badge number of conductor or operator and motorman. Spaces are provided to record by trip the vehicle and fare box number and the schedule and actual leaving time from each terminal. Corresponding to each trip the records of transfers collected and passengers carried are given.

On the reverse side space is provided for cash register, ticket register and transfer record for the cities of Canton, Massillon and New Philadelphia. It is believed that the use of this standard form of trip sheet will simplify the auditing by making all the records uniform.

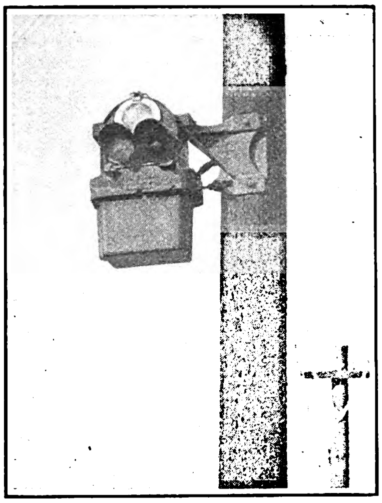
Permissive Signals at Junctions

Distant Repeater and Counting Features Facilitate Car Operation on Single-Track Line—Details of the System Are Given

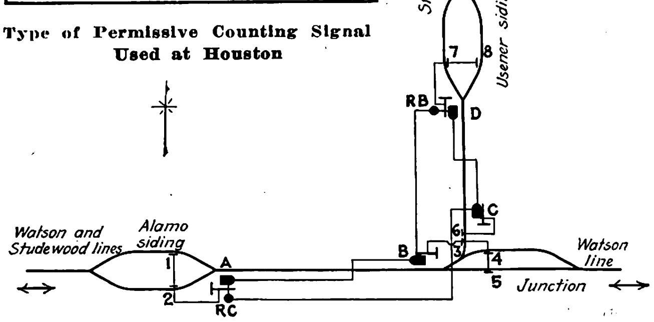
AUTOMATIC signals of the car-counting or permissive type, made by the Nachod Signal Company, are used by the Houston Electric Company, Houston, Tex., to protect cars operating through a junction of single-track lines. These signals are part of an extensive system covering the single-track lines in the city and suburbs. The installation was begun in 1920.

A block of signals *A-B* extends from Alamo siding to Junction, with its contactors 1 and 2 connected to signal *A* on Alamo siding. Contactors 3, 4 and 5 are connected to signal *B*, the latter two being on Junction siding. All contactors are of the non-moving part type and are directional. Signals *C* and *D* are on a piece of single track between Junction and Usener with contactor 6 connected to signal *C* and contactors 7 and 8 connected to signal *D*.

There is a distant repeater, *RC*, of signal *C* located on the same pole with signal *A*, which shows yellow when signal *C* is red. In addition there is a repeater, *RB*, of signal *B* located on the same pole with signal *D*, which shows red when signal *B* is red.



Type of Permissive Counting Signal Used at Houston



Layout of Signals at Junction Point Showing Method of Repeating Indications

Studewood cars operate between Usener and Alamo sidings both ways and the Watson cars operate between Alamo siding and Junction both ways. An eastbound Watson car will pass under contactor 2 provided signal *A* does not show red, regardless of whether *RC* shows yellow or dark. This will set signals *B* and *RB* at red (stop) and signal *A* at permissive. Should *RC* have been showing yellow at this time, it would indicate that there is a Studewood car proceeding toward Junction, having at contactor 7 set signal *D* at permissive and signal *C* at stop. The first-mentioned car in passing under contactor 5 would clear signals *A*, *B* and *RB* to the normal dark or neutral. The Studewood car, passing under contactor 6, would clear signals *C* and *D*, and at contactor 3 immediately set signals *B* at permissive and *A* at stop. Later these signals would be cleared at contactor 1.

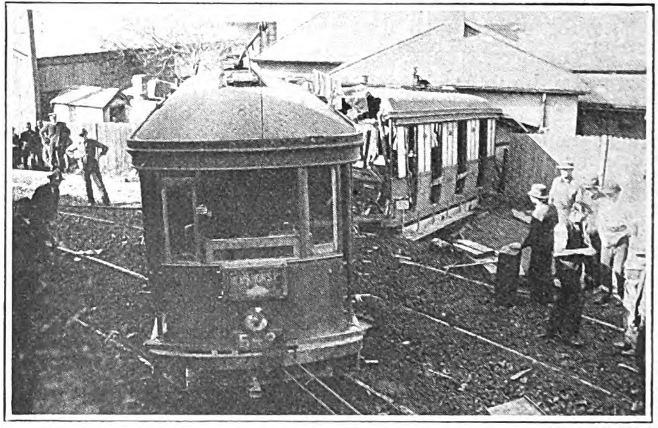
When an eastbound car, which might be either a Watson or Studewood car, is in the block moving eastward with signal *RC* dark, then a southbound car will be stopped at Usener by signal *RB* at red until the first-mentioned car has passed out of the block either at contactor 5, or continued through the second block *CD* and out at contactor 8. If *RC* is yellow an eastbound Studewood car will stop, but the Watson car may enter the block under this indication. A Studewood car southbound will always be stopped by signal *RB* at red. All signals have counting relays, so that following movements may be made through either of the blocks.

Runaway Train in Sydney

A CURIOUS accident to a two-car train occurred some time ago on the North Sydney division of the New South Wales Government Tramways. Much of the traffic on this division in the morning and evening rush hours is to and from the ferry to Sydney. There are 124 cars on this division and many grades, some of them more than 10 per cent. Train operation is common, each car of a two-car train being single truck and equipped with motors and with a controller at the outer end of each train. One motorman and two conductors are used.

In the case of the wrecked train, a defect developed in the controller on the front platform. In such cases the rules permit the motorman to operate the train from the controller on the rear platform, taking the necessary equipment with him. One conductor is then placed on the front platform to warn the motorman in the rear of any impending danger.

No difficulty was experienced in the operation of this train until a short distance of the terminus, where there is a sharp down grade. The motorman then discovered that he had left his air-brake handle with the conductor on the front platform, apparently relying on the conductor to control the movement of the train. As the conductor was not qualified to do this, the cars attained high speed and jumped the track when rounding a curve shortly before the terminus was reached. Several persons were injured and two were killed. The accompanying illustration shows the wrecked train being pulled back to the track. The accident was the most disastrous which has ever occurred on the Sydney tramway system.



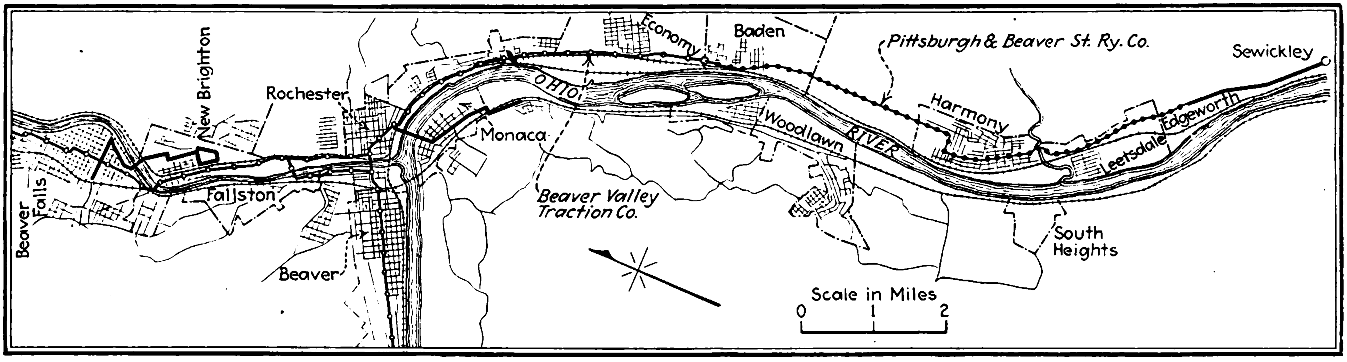
Train Which Jumped Track in North Sydney, N. S. W.

Traffic Increasing on the Beaver Valley Bus Lines

Service Rendered by Railway Subsidiary Reaches New Territory and Has Replaced Car Service on One Line—Revenue from Private Hire Business Amounts to 10 per Cent of Total—Operation of Additional Bus Lines Is Planned

BUS operation was undertaken for the first time by the Beaver Valley Traction Company in July of last year. Under the name of the Beaver Valley Motor Coach Company, buses are now operated as feeders to the railway lines that serve the Beaver Valley and also on one route formerly served by trolley cars. All told, the company operates six buses of the street-car type on three routes. The accompanying table indicates these routes, their length, the rates of fare, the headway and the number of buses needed to fill the schedules, which average 8 m.p.h.

Earnings per bus-mile show a general increase in traffic during the ten months of operation. A temporary increase occurred in April, when railway operation in Ambridge was suspended for two weeks, as told in ELECTRIC RAILWAY JOURNAL for May 23, 1925, page 826, and buses were used to carry all the local traffic in that town. At present, due to business depression in this area, the earnings are running somewhat below the level attained in the early part of the year.



The Beaver Valley Motor Coach Company Operates Three Routes in the Suburban District of Pittsburgh as Shown by the Solid Lines

The motor coach company was incorporated in February, 1924, and in the period from July 15 to Sept. 15, 1924, installed bus service upon three routes, each under different circumstances and in separate sections of the territory served by the traction company.

MONTHLY RECORD OF BUS-MILE EARNINGS, IN CENTS

	Route 1	Route 2	Route 3
July (fifteen days), 1924	20	..	..
August	22	..	..
September	22	29	14
October	26	31	15
November	29	31	19
December	31	35	23
January, 1925	34	37	28
February	36	37	32
March	35	37	31
April	33	32	29

Operation was first commenced on a 2-mile route from Leetsdale to Sewickley. This district was formerly without local transportation service of any kind. At Leetsdale is the southern terminus of the Pittsburgh & Beaver Street Railway where the cars of the Beaver Valley Traction Company operated by agreement. Sewickley is the northern terminus of the Pittsburgh Railways.

The Lincoln Highway connects these towns and also the Borough of Edgeworth, which lies between, as shown on the accompanying map. Between Sewickley and Pittsburgh there is considerable commuting via the Pennsylvania Railroad. By continuing the bus route through the town to the railroad station a large number of commuters are accommodated.

A flat fare of 10 cents is charged on this route, which was started July 16, 1924. The headway is 30 minutes during the day and 20 minutes in the rush hours. Service is withdrawn after 8 o'clock in the evening.

The monthly record of bus-mile earnings is shown in the accompanying table. Revenue increased from 20 to 36 cents per bus-mile since operation started and now is large enough to meet the cost of rendering the service.

On the route from Beaver Falls to New Brighton buses replaced a single-track street car line 2.7 miles long. This trolley line had failed to earn its operating expenses for many years past with a nickel fare and a twenty-minute headway. Request had been made of

DETAILS OF BUS ROUTES OPERATED BY BEAVER VALLEY MOTOR COACH COMPANY

Route	Date Opened	Length in Miles	Fares: One-Way Cash	Fares: Ticket	Headway Minutes: Normal	Headway Minutes: Rush	No. of Buses: Normal	No. of Buses: Rush
1. Leetsdale to Sewickley	July 16, 1924	2.0	10	none	30	20	1	2
2. Beaver Falls to New Brighton	Sept. 1, 1924	2.7	10	7@50c.	20	15	2	3
3. Rochester to Colona	Sept. 15, 1924	2.2	10	none	30	30	1	1

Buses owned: One 25-passenger White-Bender, two 25-passenger Mack-Bender, three 24-passenger Pierce-Arrow-Thompson.

the railway company to repair its pavement, and this would have necessitated tie removal, which, in turn, would have demanded providing a new and substantial substructure. The cost of doing this work would have reached $125,000, whereas the investment in necessary bus equipment was but $21,000.

Since inaugurating bus service, Sept. 1, 1924, the development of traffic has been such as to necessitate a fifteen-minute service for a two-hour period during the evening rush hour. In this case the cash fare is set at 10 cents with seven tickets for 50 cents. Tickets are used by 60 per cent of all passengers carried.

The third bus line of the Beaver Valley Motor Coach Company is operated from Rochester to Colona. Between these towns an independent bus line operated on a 5-cent fare was already in existence. Upon application to the Public Service Commission a certificate of convenience and necessity was granted to the company, however, and service was started on Sept. 15. The fare on this line has always been 10 cents, but owing to the depression in the steel business, the revenue of the bus line was small for a period of several months. More recently it has increased to a point where it about equals the operating expenses.

The Beaver Valley Motor Coach Company now has an application before the Public Service Commission of Pennsylvania for an additional route from Rochester to Woodlawn, a distance of 7 miles. This line would serve communities which at present lack adequate local transportation. Recently the commission granted an application to this company to operate a bus line from Beaver Falls to Beaver by way of Fallston. Although the Beaver Valley Traction Company now operates a railway line from Beaver Falls to Beaver, this bus route would serve in part new territory and would afford a more rapid means of transportation between the terminal towns. Fare for the through trip is to be 25 cents, whereas the fare on the street car line is 15 cents. The higher fare is warranted because of the more direct and rapid means of communication.

A substantial part of the total revenue of the company has been obtained from the operation of private hire or chartered buses. This has amounted to as much as 10 per cent of the gross receipts from bus operation. It is hoped to increase the earnings from this source by extensive advertising and publicity work.

As one step in the encouragement of party bus service a circular has been mailed to every organization in the Beaver Valley district. The next mailing will probably cover all of the customers of the associated light companies. It is expected that the chief business will be into Pittsburgh. The rate for this trip of 30 miles for a party of 20 to 22 passengers in a 24-passenger bus will work out about 3.5 to 4 cents per passenger-mile. This compares with 3.6 cents per mile on the steam railroad for one-way rates, but the actual comparative rate on the railroad is 1.9, obtainable by ten-trip tickets good for three months and for any number of persons in the party; thus five persons could use one ten-trip ticket on an excursion journey. On the other hand, of course, the bus party is taken from door to door so that the bus rate is justified through the higher class of service.

Soon after the Sewickley-Leetsdale service was started, the company sent postcards, with return card attached, to residents of the community to be served, using the mailing list of the electric light company. On these cards the following questions were asked:

1. Do you make frequent trips that would permit you to use this service?
2. Do you travel by train to Pittsburgh frequently?
3. Is our coach connection between the two street railways of advantage to you?
4. What do you recommend to improve our service to you?

Replies received indicated that the service was greatly appreciated by residents of the district. These cards were followed up from time to time with other requests for comments or statements from the company, all with the idea of maintaining prestige for the service and to keep the company's name in the public mind.

COSTS OF OPERATION

Depreciation is charged at 5 cents per bus-mile. Under this arrangement the investment will be amortized in about five years. There is also a general repair reserve fund for which 3 cents per bus-mile is charged. Unusual repairs necessitating the expenditure of more than $200 are charged against this fund instead of being allocated to the operating account. By this means the monthly expenses are more or less stabilized, and costs for one month do not vary greatly from those of another.

Expenditures for fuel, labor, and materials used in maintenance average about 5 cents per bus-mile. White, Mack, and Pierce-Arrow buses are used. Fuel and maintenance costs vary only slightly between the different types of bus.

Items listed above come to about 13 cents per bus-mile. A somewhat greater expenditure is required for drivers' wages, insurance, interest, general overhead, etc.

The satisfactory revenue showing of the regular routes operated by the Beaver Valley Motor Coach Company is attributed by C. D. Smith, general manager, to the combination of an adequate fare and the application of modern principles of merchandising transportation service. By co-operating with the Beaver Valley Traction Company the bus company has been able to protect the railway from independent competitive bus operation.

Good Employee Safety Record on Beaver Valley Lines

NOT a single fatal accident to an employee has occurred on the lines of the Beaver Valley Traction Company, New Brighton, Pa., during the past four years. Neither has there been a permanently disabling accident, and only four occurred which caused more than ten days disability. During 1924 there was a total of only 24 such accidents, a decrease of 47 per cent from the preceding year. The decrease in accidents causing disability of less than ten days was 185 per cent from that of 1923, and the number of working hours lost was 233 per cent less. On the basis of this record, the company was the winner of the Rice safety award for the best record in accident prevention. In competition with the railway were the industrial plants and railways of twelve counties in western Pennsylvania. The award was originated by the late Cecil G. Rice at the time he was president of the western Pennsylania division of the National Safety Council, and was presented to the company that shows the greatest reduction in employee accidents for the year 1924 as compared with the average for 1921, 1922 and 1923.

Camshaft Control on Locomotives Built at St. Catharines

Layout of Apparatus Is Arranged for Easy Inspection and Repair—Two Units Were Built by Railway to Care for Growing Freight Business

INCREASE in traffic on the Niagara, St. Catharines & Toronto Railway, a part of the Canadian National Railways system, reecntly caused the company to build two new freight locomotives. After the amalgamation of the Canadian National and the Grand Trunk Railways it was decided that the Niagara, St. Catharines & Toronto Electric Line should handle all freight on the Merritton-Port Dalhousie division of the Grand Trunk. This added so largely to the volume of such business being handled that it was decided to augment the motive power.

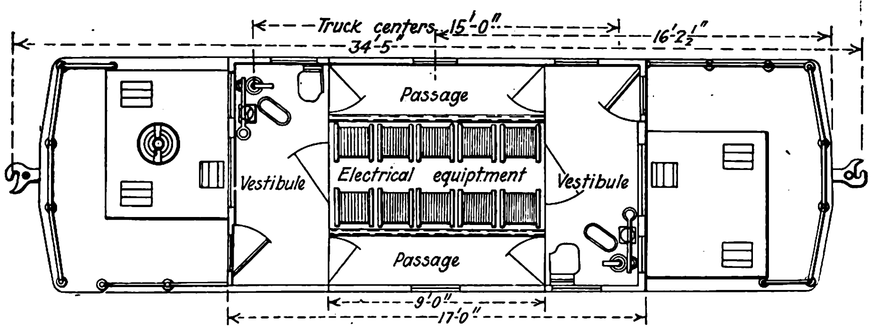
Accordingly two 50-ton locomotives were built at the shops in St. Catharines. Motors and control equipment were furnished by the English Electric Company of Canada, Ltd. It is said that this is the first English Electric camshaft control equipment used in America. The electric equipment is assembled in two groups, each of which consists of two motors and control. These groups are placed in parallel or in series position by means of a remote-control switch. With the change-over switch in either position the two motors of either group may be connected in series or parallel with each other, through the operation of the camshaft governed by the master controller. Control apparatus is actuated by current taken from the line.

Each pair of motors is provided with a DK S-500 Form B circuit breaker of the hand-setting type. This type is preferred in order to insure a brief examination of the control compartment by the motorman after the circuit breaker has opened and before it is closed.

The controller consists of a number of steel cams which are mounted on a mica-insulated steel shaft driven by an electric motor through flexible worm gearing. The cams are set at different angles and each one in its turn closes a contactor. Only two of these contactors are fitted with arc chutes. Line breakers interrupt the normal working current and thereby save wear and tear on the remaining contactor tips, which break only a small equalizing current. The master controller is fitted with the usual notch-regulating device and has nine series and six parallel notches.

An important feature in connection with these locomotives is the rapidity with which the various parts can be inspected and removed for repairs. All the apparatus is directly under the eye of any one entering the control compartment, as shown in an accompanying illustration.

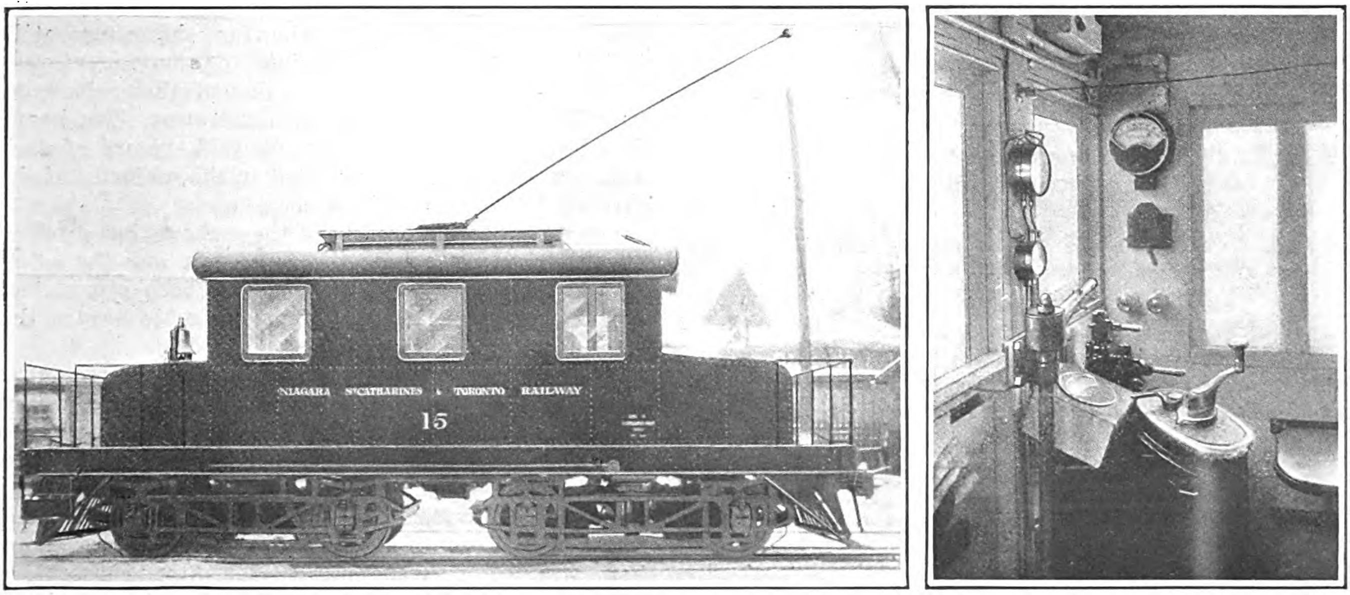
Motors are of the DK-75-3-B type with 190 hp. capac-



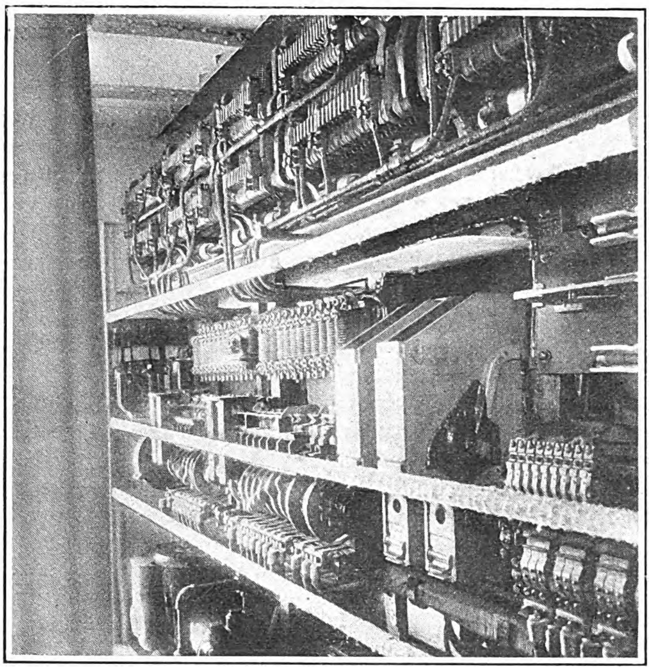
Layout of Apparatus in the New Freight Locomotive of the Niagara, St. Catharines & Toronto Railways

SPECIFICATIONS OF 50-TON FREIGHT LOCOMOTIVE OF NIAGARA, ST. CATHARINES & ONTARIO RAILWAY

Weight:	
Body	39,804 lb.
Trucks	24,400 lb.
Electric equipment	31,900 lb.
Air equipment	4,620 lb.
Total	100,760 lb.
Bolster centers, length	15 ft. 0 in.
Length over all	34 ft. 5 in.
Truck wheelbase	8 ft. 0 in.
Height, rail to trolley base	11 ft. 11½ in.
Body	All steel
Air brakes	Westinghouse No. 14 EL
Axles	6-in.
Brake cylinder	12 in. x 12 in.
Compressor	General Electric CP-30, 37 cu.ft. capacity
Control	DK, M7, camshaft type
Couplers	Sharon 5-in. shank
Hand brakes	Peacock and Dayton ratchet mast
Heater equipment	Consolidated
Headlights	C-H. luminous arc
Journal boxes	5½ in. x 10 in.
Motors	Four DK-75-3-B, inside hung
Sanders	Wilson
Trolley base	U. S. heavy type
Trucks	American Locomotive Company
Wheels	36-in. MCB standard tread steel tire, cast hub



The Body of the New St. Catharines Locomotive, Shown at Left, Is Divided into Three Sections with a Cab at Each End and an Equipment Compartment in the Middle. At Right, Master Controller Which Operates the Camshaft Control in the Compartment



Electrical Equipment Is so Arranged that It Can Be Inspected Easily and Removed for Repairs

ity at 270 amp. and 600 volts. The locomotive will start a train weighing 710 tons and reach a speed of 16 m.p.h. in one minute on level tangent track. Helical gears with a ratio of 81/15 are used. The wheels are of 36-in. diameter. Weights and specifications of various other equipment used on these locomotives are given in the accompanying table.

Arousing Interest in Safety Reduces Accidents

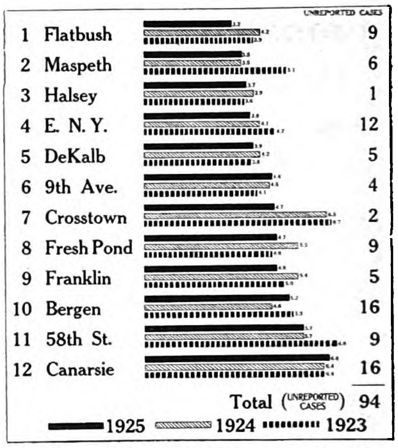
Charts Bring Home to Trainmen in Brooklyn a Realization of Serious Condition Existing During the Winter

LAST January, when Brooklyn was buried in snow and ice and the already congested street traffic was further crowded by the encroachment of piles of snow along the sides of the highways, accidents on the various surface lines operated there reached a peak. The combined accidents of all classes on all divisions of the surface lines of the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad reached a record total of 2,898 for the month. This number led the officials of these companies to undertake a vigorous safety campaign to cope with this situation. The results have been fully up to the expectations and desires of the officials, as indicated by a drop to 1,958 accidents in the month of March, which showed a material reduction, being lower than the corresponding number for the same month in either one of the two preceding years.

Mechanical Department Safety Box Score

Shop	1924 June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1925 Jan.	Feb.	Total
Canarsie	x	x	x	x	x	x	x	x	x	9
Flatbush	x	x	x	x	x	x	x	x	x	9
Crosstown	x	x	x	–	x	x	x	x	x	8
Montrose Avenue	–	x	x	x	x	x	x	x	x	8
Ridgewood	x	x	x	–	x	x	x	x	x	8
58th Street	–	x	x	x	x	x	x	x	x	8
De Kalb Avenue	–	x	x	x	–	x	x	x	x	7
Maspeth	x	x	x	x	–	x	–	x	x	7
23d Street	x	–	x	–	x	x	x	x	x	7
Bergen Street	–	x	x	x	x	x	x	–	–	6
Electrical Repair	x	–	–	x	–	x	x	x	x	6
Queens Plaza	x	–	–	–	x	x	x	x	x	6
East New York Surface	–	–	–	–	x	x	x	x	–	4
36th Street Repair	–	x	–	x	–	x	x	–	–	4
Ninth Avenue	–	–	–	–	x	–	x	–	x	3
East New York Repair	–	–	–	–	–	–	x	x	–	2
East New York Inspection	–	–	–	–	x	–	–	–	x	2
Fresh Pond	x	–	–	–	–	–	–	–	–	1
39th Street	–	–	–	x	–	–	–	–	–	1
52d Street	–	–	–	–	–	x	–	–	–	1

The "Box Score" Shows the Shops that Had No Time Lost by Any Employee on Account of Accidents in Each Month



A Wall Chart in Colors Is Used to Show Comparative Accident Records on the Brooklyn Surface Lines

The procedure followed in this campaign was very simple and direct. It was dictated by the necessity of securing immediate results. Led by Clinton E. Morgan, vice-president and general manager of the Brooklyn City Railroad, in his capacity as operating manager of the joint operations of surface lines of the two companies, meetings were held in all the depots. The men who operate the cars were addressed. Charts were used which showed graphically and with startling simplicity the serious condition confronting the companies. Assisting Mr. Morgan were F. W. Lawrence, safety supervisor; William Siebert, superintendent of surface lines of the B.-M. T., and A. L. Hodges, assistant secretary and treasurer of the Brooklyn City Railroad. First, they showed the men of each operating depot the way in which accidents had increased in number and seriousness on the whole road. Then they went into details of the various classes of accidents and numbers of each on the various lines. Thus actual conditions on the lines where they operated were brought home to the men. Instructions were given in ways and means of avoiding some of these accidents.

Meetings are held each month at which the figures for the preceding month are discussed. Prior to the meetings, however, graphic charts printed in colors were posted in all depots showing the comparative statistics of accidents by divisions for the current year and the preceding two years. One of these charts is reproduced in the accompanying illustration. The heavy black lines, indicating the March, 1925, record of accidents per 10,000 miles, show that in the majority of the divisions there was a decrease.

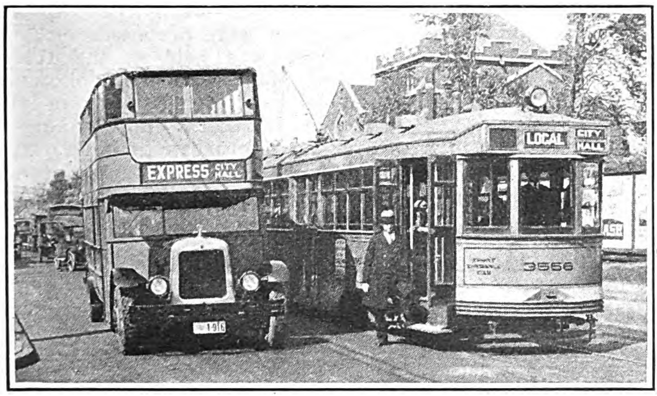
It is said that the posting of these charts has aroused a healthy interest among the car crews, and the spirit of competition between divisions has been stimulated. Naturally this has resulted in a desire to secure the leadership in minimum number of accidents.

The competitive idea in securing accident reduction is also carried out in the mechanical departments, where each shop is pitted against all the others in a race to show the greatest number of months per year with a 100 per cent safety record. This 100 per cent record is defined as "no time lost by any employee during the month on account of accidents at work." Two shops have attained perfect records for nine consecutive months, as shown in the "box score" which has been adopted for posting in the shops.

Experiments with "Four-Track" Bus and Car Service

IN ITS studies on co-ordinated rail and bus service in Detroit, the Department of Street Railways of that city recently conducted a test on Gratiot Avenue. The purpose of this test was to determine the saving in time possible to passengers if a co-ordinated express and local service was given by bus and car on Gratiot Avenue. To secure immunity from traffic delays, the test was made early Sunday morning, April 26, between 1:30 a.m. and 3:30 a.m., between Seven-Mile Road and Cadillac Square. This is a one-way distance of 7.8 miles. A double-deck coach (totally inclosed type) and a Peter Witt car were used.

The run inbound from Seven-Mile Road was made with both vehicles in local service, i.e., making all schedule and compulsory stops. The schedule stops, of which there were 62, were fifteen seconds each, and five "compulsory" stops were made in only sufficient time for the car or bus to be brought to a stop and restarted. The total number of local and compulsory stops was 67, or 8.59 per mile. The elapsed time for each vehicle on this run was practically the same, being 47 minutes 40 seconds for the coach and 47 minutes 50 seconds for the car.



Bus and Car Used in Test of Co-ordinated Service, Detroit

The run outbound from Cadillac Square was made with both vehicles in express service, i.e., they made 25 scheduled stops and three "compulsory" stops, the durations being the same as during the local run and the total number of stops averaged 3.58 per mile. The elapsed time for this express run was 28 minutes seven seconds for the coach and 29 minutes for the car. This test showed that under the conditions under which it was run, a saving of about nineteen minutes could be made by either vehicle when the number of stops were reduced in the proportion named. Views of the bus and car used are shown above.

Whether this differential of nineteen minutes could be maintained throughout the day is considered debatable by the department. It might easily be done if automobile parking was prohibited, if all or most of the other vehicular traffic was directed to other streets, and if the fullest use was made of the traffic signals at all important intersections, but it is felt that such restrictions might bring forth some protest from other users of the street. On the other hand, it is a fact that some economical traffic congestion alleviation means must be devised sooner or later.

While the illustration shows the bus marked as express and the car marked as local, the department does not consider that the test was sufficient to determine which type of vehicle would make the better express unit in this service. This phase of the question will receive further consideration.

Operations of Twelve Large Properties Compared

FOLLOWING the practice of several years past, statistics of six of the largest surface lines and an equal number of rapid transit companies for their latest year are published herewith. In our issue of this paper for May 2, 1924, an analysis of operations on 93 city properties was presented. While these 93 properties represented a total of $354,000,000 in gross earnings, the selected twelve companies in the larger cities took in $336,000,000. They operated about one-ninth of the track mileage in the United States. While six of the companies are classed as rapid transit, only three of them operate elevated or subway lines exclusively, the other three having combinations with surface lines. Each of the twelve companies earned above $8,000,000 last year, and the average receipts exceeded $28,000,000.

The six surface companies showed practically no change from 1923 in gross earnings, and the same is true of operating expenses, including taxes and depreciation. In the rapid transit group the gain in receipts and in expenses was about 2.5 per cent. The operating ratio, including taxes and depreciation charges, averaged 83.74 per cent for the surface properties, compared with 2.87 in the previous year, and ranged from 80.17 to 89 per cent. For the rapid transit lines, the average operating ratio was 71.83, compared with 72.4 in the previous twelve months, and ranging from 56.4 to 80.5. Selecting the three roads which operate subway or elevated lines exclusively, the average was 66.23, as against 68 the year before.

Greater service was rendered by each car in the surface lines group, as indicated by the annual miles operated per car. This figure averages 35,083, compared with 34,752 in the preceding year. Rapid transit lines, on the other hand, showed a decrease, namely, 42,355 miles per car, as against 42,475. Total passengers per mile of single track operated varied from 948,394 to 2,244,152 on the surface lines and from 1,423,671 to 1,546,435 on the rapid transit lines. For the former group there was a decrease of 6.8 per cent and for the latter an increase of 3.1 per cent. It should be understood, however, that several companies, especially rapid transit lines, do not keep account of transfer or free passengers. For that reason an exact comparison is not possible. Revenue passengers on surface lines decreased 1.7 per cent, while car mileage was increased 1.6 per cent. On the rapid transit lines there was a gain of 2.2 per cent in passengers and 3.6 per cent in car mileage.

STATISTICS PER CAR-MILE AND PER CAR-HOUR ON TWELVE LARGE ELECTRIC RAILWAYS

	Six Surface Roads						Six Rapid Transit Roads					
	1919	1920	1921	1922	1923	1924	1919	1920	1921	1922	1923	1924
Transportation revenue per car-mile, cents	38.9	44.7	47.8	47.8	48.3	47.6	33.1	38.0	38.0	40.8	39.4	39.6
Expenses and taxes per car-mile, cents	32.5	37.6	43.2	43.2	43.4	41.9	25.9	30.6	33.4	31.1	32.3	30.5
Transportation revenue per car-hour, dollars	$3.26	$4.00	$4.03	$3.14	$4.11	$4.03	$4.21	$4.63	$5.21	$5.14	$4.85	$4.80
Expenses and taxes per car-hour, dollars	$2.75	$3.37	$3.62	$3.64	$3.59	$3.50	$3.25	$3.70	$4.13	$3.81	$3.84	$3.66
Operating ratio, per cent	83.06	87.45	85.08	83.34	82.87	83.74	74.00	77.26	77.92	71.63	72.40	71.83

Association News & Discussions

California Superintendents Discuss Operation

REPRESENTATIVES of the operating departments of California electric railways, organized as a superintendents committee of the California Electric Railway Association, held their semi-annual meeting in Sacramento, May 8 and 9. Publicity and advertising men, who constitute the public relations committee of the state association, met with the superintendents and participated in the program.

In a talk on "Employment and Training," A. W. Brohman, superintendent Market Street Railway of San Francisco, said that the intelligence test, somewhat similar to that used in the United States Army during the world war, had been discontinued because it proved to be merely a test of mental agility and not of ability and resourcefulness. All instruction on the road is given by a single instructor. This occupies seven to ten days, in which the new man studies all lines of his division. The plan of having one man in charge of a new man through his breaking-in period has been found highly beneficial, Mr. Brohman said.

Weekly meetings of the line instructors, follow-up men, dispatchers and division superintendents are held for general discussion of common problems. Mr. Brohman concluded his talk with the following quotation from the annual report to the stockholders:

"Notwithstanding the great increase in automobile traffic there has been no material increase in the number of accidents or expenditures for claims. Accidents involving fatalities were fewer than ever before in the history of the company or its predecessor. This we believe is due entirely to the training system for carmen which was inaugurated a few years ago and has continued to develop satisfactorily, and will unquestionably continue to reduce both labor turnover and the number of accidents and heavy expense incident thereto."

Discussion on traffic congestion was directed by George B. Anderson, manager of transportation Los Angeles Railway. He reviewed some of the material that he had presented to the American Electric Railway Association as chairman of the committee on traffic congestion and pointed out that automobile owners and drivers are highly organized to advance their own interests, while the majority users of transportation, the street car riders, are left without representation except by the electric railways. It becomes their moral obligation therefore to act in behalf of this majority by initiating measures of traffic relief. The subjects that these measures must deal with were enumerated as automobile parking, one-way streets, protection for principal street car arteries similar to that given to principal automobile boulevards, segregation of traffic, prohibiting jay-walking, prohibition of parades where they interfere with essential traffic, left-hand turns, street car safety zones, protection of boarding and alighting passengers and examination of applicants for automobile drivers' licenses.

Bus operation was discussed by F. Van Vranken, manager Los Angeles Motorbus Company. Tire mileage was a leading topic of general discussion following his paper. In this connection it was stated that all the double-deck buses operated by the Los Angeles Motorbus Company and the Los Angeles Railway are equipped with pneumatic tires.

Ben S. Allen, manager public relations department, Key System Transit Company, spoke for the public relations committee on methods of co-operation between the operating men and the men directing public relations. He emphasized that the giving of adequate service by courteous trainmen is essential to good will because passengers who have to hold onto a crowded car by their eyebrows are not likely to feel friendly toward the transportation agency.

A review of recent state legislation affecting the electric railway was made by W. V. Hill, manager of the association. He said that the session closed without any bills inimical to the state railway interests being passed, although several were proposed.

A banquet was held at the Hotel Senator on May 8 and the following day the delegates were guests of the Sacramento Northern Railway on a trip over its interurban to Chico. The next joint session of the superintendents committee and public relations committee will be held in Los Angeles in November.

Commerce Chamber Elects Officers

CONCLUDING sessions of the United States Chamber of Commerce were held in Washington on May 22. The subjects considered were general in their nature. The principal business of the afternoon session was the election of officers and directors for the ensuing year. The officers elected were: President, John W. O'Leary, Chicago; regional vice-presidents, Louis E. Pierson, New York; William Butterworth, Moline, Ill.; Robert R. Ellis, Memphis, and Paul Shoup, San Francisco; honorary vice-presidents, Owen D. Young, New York; Henry M. Robinson, Los Angeles, and R. W. Boyden, Boston; treasurer, John Joy Edson, Washington.

Among the seventeen directors elected the following are best known to electric railway men: Philip H. Gadsden, Philadelphia, Pa., for the Second District; A. J. Brosseau, New York City, for the Manufactures Department; Paul Shoup, San Francisco, Cal., for the Foreign Commerce Department, and A. L. Humphrey, Pittsburgh, Pa., for the Transportation and Communication Department.

HOUSING AND CIVIC DEVELOPMENT

Problems of civic development as related to city planning, building construction and home ownership, the first dealing especially with such systematic layout as will bring proper functioning of utilities, were considered in papers presented before the Civic Development group and in discussion of the papers which followed.

The speakers were Dr. John M. Gries, chief of the Building and Housing Division, Department of Commerce, "The Building Congress—Its Purposes and How It Is Achieving Them in Five Cities"; Thomas Adams, general director of plans and surveys, Regional Plan of New York and Its Environs, New York City, "Economic Use of Land in Urban Communities"; and Morris Knowles, civil engineer and city planner, Pittsburgh, "Housing in Relation to Citizenship." Numerous delegates participated in the discussions. John S. Lonsdale, of St. Louis, presided.

Dr. Gries told of the experiences in

COMING MEETINGS OF

Electric Railway and Allied Associations

June 2-4—**Central Electric Railway Association, French Lick Springs, Ind.**

June 3—**Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

June 3-5—**Iowa Electric Railway Association, Waterloo, Iowa.**

June 10-12—**Canadian Electric Railway Association, Montreal, Quebec.**

June 26-27—**New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

July 22-25—**Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

Oct. 5-9—**American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

New York, Boston, Philadelphia, New Jersey and Oregon in the organization of all interests concerned with the construction industry into building congresses to co-operate in problems common to all, jurisdictional disputes among labor and differences among builders, supply men, etc. The congress must be purely local to succeed, he said. Settlement of differences by arbitration he mentioned as one of the important aims. Governmental agencies should not undertake work of this character unless private industry defaults, Dr. Gries said. He urged building interests to confer in each community regarding the construction program in order to avoid peaks and valleys and thus stabilize conditions.

"Efficiency is born of order and beauty," asserted Mr. Adams, who declared that city planning means more than to devise means of moving streams of automobiles through the streets.

Mr. Adams emphasized the necessity of sound zoning laws to control development of urban property. He cited specific instances of excessive taxation due to lack of a plan in developing a city's growth. Transportation, sewage, electric and other utility systems often are unnecessarily wasteful because of haphazard development, he said. He advanced the suggestion that it would be more profitable to use some suburban properties for agricultural purposes until conditions justified improvement than to permit them to lie idle until this time arrived. Land must increase 10 to 15 per cent in value annually in order to justify investment in its development, he said. He told of experiences of some cities which laid costly public service lines without ability to put them to use.

Mr. Knowles urged home ownership to bring improved citizenship. The great question is proper financing, he said. Operative-builders offer the best hope to stop the decline in home ownership, he said, pointing out evils in government assistance and in industrial homebuilding.

INSURANCE A TOPIC

At the Insurance Group meeting, casualty insurance and accident prevention were discussed by George W. Wells, Jr., insurance commissioner for Minnesota, and fire insurance and fire prevention by Stacey W. Wade, insurance commissioner for North Carolina. H. A. Smith, president National Fire Insurance Company, described the insurance service of the chamber for 1924-1925.

According to Mr. Wells, the policyholder should be vitally interested in getting the maximum service from the reservoirs of insurance funds and that the supply in them is conserved so there is no unnecessary drain to pay for losses that could have been prevented. Among things the policyholder should do are: (1) Read the contract and know just what it contains; (2) place insurance only with carriers authorized to do business in this country; (3) safeguard legislation interests; (4) reduce waste.

Forty-two states, said the speaker, now require practically that employees injured as the result of industrial accidents be indemnified according to a definite schedule regardless of the question of negligence of the employer. This is now taken as an accepted condition of doing business. Legislators alone are not responsible for this trend. They are influenced by the opinion of constituents. Insurance companies have no voice in forming these laws. Policyholders themselves are at fault because legislators do not know what they are thinking. While the individual cannot do much, co-operation through chambers of commerce or trade associations should allow groups of policyholders to speak with authority.

American Association News

Exhibit Space Application Forms Go Out Monday

BY F. C. J. DELL

Director of Exhibits American Electric Railway Association

APPLICATIONS for exhibit space for the October convention will be mailed from association headquarters on June 1. June 30 is the last day to file space requests in order to have them considered by the committee when it meets to make the initial space assignment early in July.

The hotel managements are making arrangements to take care of the largest crowd of convention delegates ever assembled in October. Many companies postpone this until after the vacation season. This procrastination often results in disappointments.

Railway companies and car manufacturers will have an excellent opportunity this year to show city or interurban cars. The Atlantic City authorities have provided a specially built track down Arkansas Avenue which will extend from the trolley tracks on Atlantic Avenue to the foot of the Boardwalk. A temporary curve will connect this track with the trolley tracks. Cars will come in over the Pennsylvania Railroad carded to the Chelsea yard and will be run down to Arkansas Avenue and over to the foot of the street opposite the Pier. The association has received a special rate from the drayage contractors, which will materially reduce the cost to exhibitors. The association has never, until this year, had proper space to show cars at Atlantic City. The platform which was usually provided at considerable expense only accommodated four or five cars and the exhibitors were put to great expense to get the cars over to and placed upon this platform.

Railway companies will again be given an opportunity to exhibit on the Pier. Last year some half dozen railways used space for various purposes. Among them were the Chicago Rapid Transit Company, the Chicago North Shore & Milwaukee Railroad, the Public Service Railway and the United Railways & Electric Company of Baltimore. These exhibitors used their booths to show what they were doing in the way of bus operation, general advertising, safety work, maintenance and engineering work, record keeping, etc., and to give their delegates headquarters on the Pier.

Space applications have been sent to all railways and it is expected the response to the opportunity presented will be quite general, especially from the larger companies.

The executive committee has set aside a special day for the inspection of exhibits. Wednesday, Oct. 7, will be devoted entirely for this purpose. No meetings of any kind will be held and the delegates will be free to devote the time to looking over the various displays.

At a recent meeting of the executive committee the following resolution was passed:

"Whereas certain manufacturers of automotive equipment have in past years brought buses to our Atlantic City convention and parked such vehicles at advantageous points in the vicinity of prominent hotels and extended invitations to railway delegates to accompany their representatives on demonstrations trips; and

"Whereas such practices tend to defeat the purposes of the exhibition by reason of such railway delegates absenting themselves at various times from the exhibition proper and thus perhaps neglecting the study of exhibits of other manufacturers; and

"Whereas the action of this committee last year in withholding its approval of such practice proved to be so satisfactory for all exhibitors at the convention; therefore, be it

"Resolved, That this executive committee in meeting assembled this 14th day of April, 1925, hereby again votes to look with displeasure upon any manufacturers having exhibits at any place other than that designated by the association."

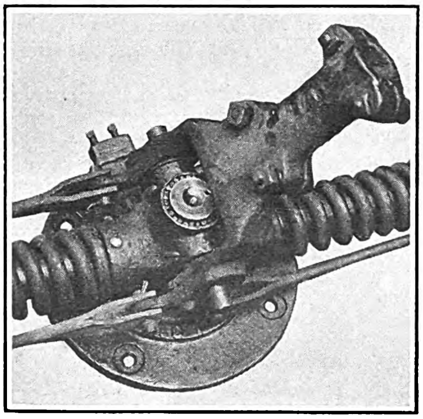
This action by the committee is for the benefit of the convention as a whole, as the most important thing about any convention is to keep the delegates together all during the meeting. No one manufacturer should be given the opportunity of having any advantage over any other manufacturer. Besides, it places some restraint upon those manufacturers who are not connected with the association as members, but who do take advantage of the convention and come to Atlantic City with the idea of demonstrating their products in hotel rooms or upon the streets. Therefore, the executive committee's action is nothing more or less than a protection to all association members and exhibitors.

If you have not already done so get your space applications into headquarters without delay. If for any reason you have not received applications it is suggested you communicate promptly with association headquarters.

Maintenance of Equipment

Roller Bearings for Worn Trolley Bases

SPINDLES and inside bearings have become worn, so that repairs are necessary on a number of U. S. No. 1 trolley bases used by the New York State Railways, Utica lines. These are reconstructed in the Utica Park shop of the company in the following manner. The spindle is turned down slightly and a small cut taken off inside the bearing. This leaves a space so that cold-rolled steel rollers can be installed.


Reconstructed Trolley Base on Which Cold-Rolled Steel Rollers Are Used in Center Bearing

With the first reconstruction, 1/8 in. diameter rollers are used. The size is increased to 3/16 in. and to 1/4 in. as further wear takes place. This type of construction is made just as cheaply as boring out and rebushing could be done, and at the same time the advantages of a roller bearing are obtained.

Keeping Down Number of Joint Failures

ON THE Eastern Massachusetts Street Railway system an extensive welding program carried on during the past four years has raised the mileage of welded track to 58.3 per cent of the total. This company has 331.9 miles of paved track, of which 149.7 miles, or 45.1 per cent, is welded, and 305.2 miles of unpaved track, of which 221.5 miles, or 72.5 per cent, is welded.

RAIL JOINT FAILURES ON EASTERN MASSACHUSETTS STREET RAILWAY

	1921	1922	1923	1924
Joints welded	34,771	37,415	17,841	9,602
Plate failures	151	114	258	292
Rail failures	126	69	125	85
Weld failures	96	24	11	9
Total failures	373	207	394	386

CLASSIFICATION OF RAIL JOINT FAILURES FOR 1924 BY TYPE OF RAIL

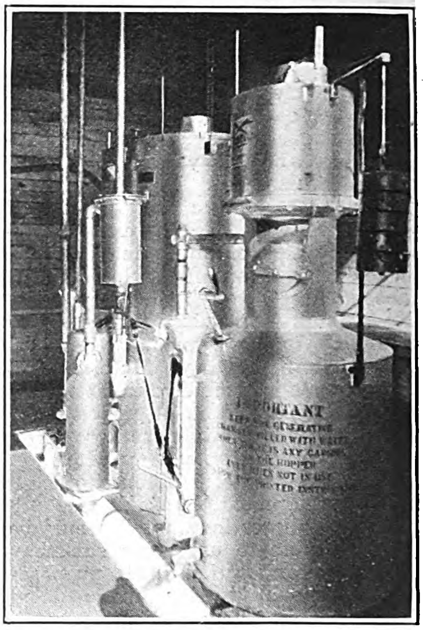
	Old Plates	New Plates	Rail	Welds
7-in. and 9-in. grooved girder rail.........	12	..	28	..
70-lb. and 75-lb. T-rail..............	117	3	32	3
60-lb., 58-lb. and 56-lb. T-rail.........	145	5	22	6
50-lb. and 48-lb. T-rail..............	10	..	3	..
Total............	284	8	85	9

Altogether there are 99,629 welded joints on the system. During the past four years there have been 1,360 failures, or 1.365 per cent of the total. In 1924 only 386 failures occurred, or 0.388 per cent. Plate failures have been more numerous than any other kind, with rail failures second. Detailed figures concerning failures are given in accompanying tables.

Welding has been done by the metallic arc process, particular attention being paid to the training of the men, as explained by Frank B. Walker in a paper recently presented before the American Welding Society, an abstract of which was published in ELECTRIC RAILWAY JOURNAL, May 2, page 698. Careful training and inspection are believed by the management to be the reasons for the low proportion of failures.

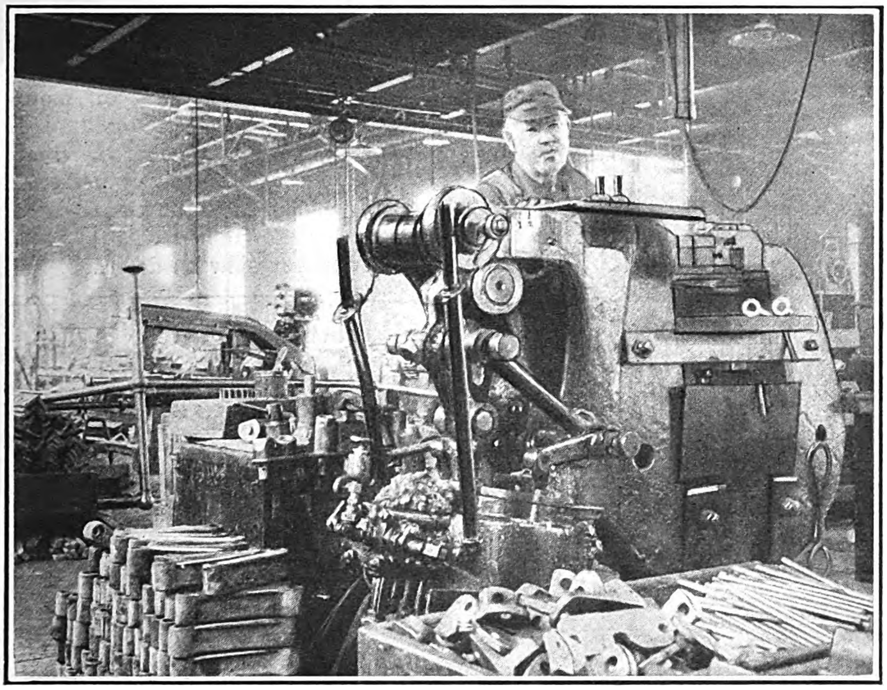
Acetylene Generators Prove Economical

LOW-PRESSURE oxweld acetylene generators of the twin type have been installed by the New York State Railways in its overhauling shops at Utica, Syracuse and Rochester. The accompanying illustration shows the installation in the Utica Park shops. The outfits have a capacity of 100-lb. nut carbide 1¼ in. x ⅜ in. and produce 100 cu.ft. of acetylene per hour. An advantage of the twin type of generator is that an uninterrupted flow of gas can be maintained, as one generator can be charged while the other is generating. The equipment is installed in a concrete foundation with drains in the floor so that refuse runs into the sewer. So that the refuse will settle before it goes to the sewer a sump is provided outside the building. This is cleaned out at frequent intervals. The company reports a saving of approximately two-thirds over the cost of buying gas.


Acetylene Generator Installation at Utica Park Shops

Preventing Converter Brushes from Being Raised

ROTARY converters in substations of the Interborough Rapid Transit Company, New York, N. Y., which are started from the alternating-current side are provided with brush-lifting devices to avoid excessive sparking at the commutator while starting. Movement of the brushes up and down is controlled from a lever with handle. The intention of this device is to provide for lifting of brushes while the machine is at rest, and while no current is passing from the brushes to the commutator. When at times they were lifted while the machines were loaded disastrous results followed and in some cases the machines were badly damaged. To prevent such occurrences, a special interlocking device has been applied to these rotary converters to prevent improper use of the brush-lifting device.



Gear Case Clamps Are Made on This Rivet Machine at a Rate of More Than 100 per Hour

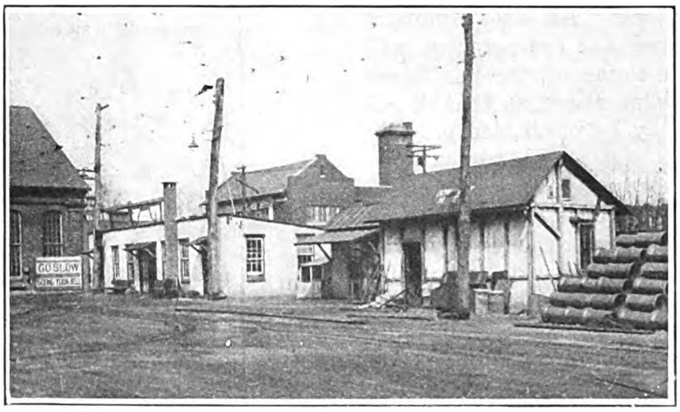
The safety equipment consists of two control switches operated by push buttons, the push buttons in turn being closed or opened by the handle of the brush-lifting device. With the operating lever in the down position, that is, with the brushes raised from the commutator, one control switch is opened by the lever pressing against a push button. This opens the circuit to the closing coil of the positive switch and so prevents the operator from picking up "load" while the brushes are off the commutator. With the brush-lifting lever in the up position, that is, with the brushes in contact with the commutator, the other control switch closes the circuit so that the operator is able to open or close his main switch and to drop or pick up load as he may desire. A small movement of the brush-lifting lever away from its up position closes the circuit to the push button and trips the main positive switch so as to cut the rotary converter off the direct-current bus. This occurs before the brushes can be raised from the commutator and the machine is thereby saved from flashing over.

Making Gear Case Clamps on a Rivet Machine

MUCH time has been saved in the Homewood shops of the Pittsburgh Railways by the practice of making gear case clamps on a rivet machine instead of doing this work by hand. The machine used is a Hanna riveter, made by the William K. Stamets Company, equipped with a special die for the purpose. Five movements of the machine are made. The first bends a steel rod to U-shape. The eye at the end is made in two more movements, and as there are two eyes this makes a total of five. About 30 seconds is required for the entire process. Previously gear case clamps were made by the blacksmith at a rate of ten per hour.

Work Car Crews Have Comfortable Quarters

HEAVY material used by the United Railways & Electric Company of Baltimore on track maintenance and reconstruction jobs is transported by work cars from the Columbia Avenue storage yard to the location where it is needed. Crews to operate these cars are under the direction of the superintendent of work cars, who has his office at the storage yard. Because the transportation of such material cannot always be arranged so systematically as is the operation of passenger cars, work crews often have a certain amount of spare time on their hands. Comfortable quarters and recreational facilities have been provided for these men in the building shown at the left in the accompanying illustration. This serves also as an office for the superintendent of work cars. As all cars must pass the building when leaving the yard he is able to keep a careful check on their operation.



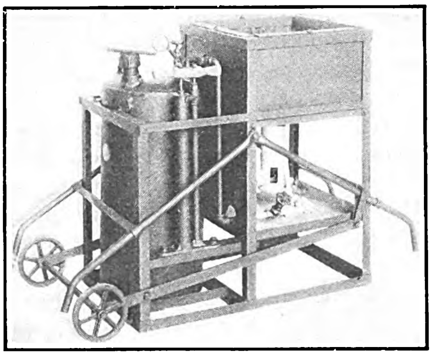
Building at Left Provides Recreational Facilities for Crews of Service Cars in Baltimore

New Equipment Available

Portable Oil Burning Furnace

A KEROSENE oil furnace mounted on wheels has recently been placed on the market by the Chausse Oil Burner Company, Elkhart, Ind. This furnace is intended particularly for use in electric railway shops for melting lead, babbitt, cyanide for case hardening, or boiling water, heating pipe and conduit to be bent, and expanding collars, gears, etc., which are to be shrunk on axles.

The machine is a combination of a Chausse oil burning torch with a retort. The forge weighs about 160 lb. empty and it has a width of 20 in., length of 36 in., and height of 33 in. The heating chamber is 14 in. x 14 in. x 16 in. high and is lined with firebrick with a flame entrance from the bottom. The kerosene tank holds 12 gal., which is sufficient for twelve hours operation at maximum temperature. The burners consume 1 gal. per hour and will deliver sufficient heat to melt 200 lb. of lead in from 20 to 30 minutes from a cold start. The maximum temperature generated by the burner is 1,800 deg., and any reduction in the amount of heat generated will, of course, decrease the fuel consumption. Pressure on the tank is maintained between 10 and 20 lb. by a Chausse hand pump. The wheel mounting of this machine is a convenient feature. When stationary, the forge sets horizontally on a firm base. By lifting on the handles at the end opposite the wheels, the wheels are lowered and the machine can be moved about without tilting. When tipped down again, the wheels rise so that the base forms a firm support.



Portable Oil Furnace for Shop Use

Lock for Fare Boxes

SECURITY against being picked or vibrated into release is provided in a four-way lock now being placed on the market by the Cleveland Fare Box Company, Cleveland, Ohio, particularly for locking its fare boxes. A number of electric railways have already adopted this as their standard for fare-box equipment. The four-way lock is opened by a four-sided key, each side of which is specially grooved to fit a particular lock. All sale numbers are registered and the patentee will register the name of the purchaser and the lock numbers, so that duplicate keys may be purchased only by the owner.

The lock body is machined from a solid block of bronze, all other parts being of brass, with the exception of the shackle and shackle stop pin. The shackle is open-hearth, cold-rolled steel, case hardened for theft and rust protection. The shackle stop pin is of music wire, spring steel copper plated. The lock has a grooved slot in the shackle which locks in the grooved slot of the bolt in such a manner that it is impossible to vibrate it out of a locked position. The lock can be oiled to increase its life and also prevent freezing when exposed to moisture in cold climates.

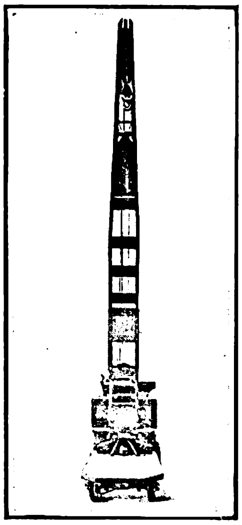
The size of the lock is 2 in. x $1\frac{7}{16}$ in. The shackle is of $\frac{3}{8}$-in. steel, and the clearance between the top of the case and the under side of the shackle is $1\frac{1}{32}$ in.

Telescoping Boom for Truck Cranes

USERS have found that long crane booms are sometimes a hindrance rather than a help, while short ones do not provide for a sufficient boom range. To meet these conditions an improved form of telescopic boom has been designed by the Ellwell Parker Company, Cleveland, Ohio, for its type C.K. portable electric cranes, with four settings between 12 and 17 ft. The boom is of all-steel construction and is raised or lowered by special cables operated from an electric motor-driven hoist unit with two grooved drums. The second drum carries separate $\frac{3}{8}$ in. plow steel non-twist cables to a two-part line-hook block sheave on the boom tip.

The heavy side panels of the boom are latticed and gusseted with a continuous $\frac{1}{4}$-in. steel plate extending from the hoist cable sheave to the boom elevating sheave. The lower box or enveloping section of the boom is of plate steel, providing a strong support for the telescopic portion.

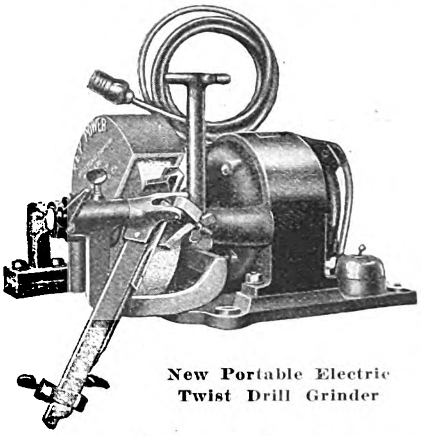
The distance from the top of the boom to the hook is but 23 in. This has been accomplished by suitably locating the trip switch. This design has advantages when handling loads in low head room, or for reaching over a gondola car, or motor truck. The steel crane column is supported on ball and roller bearings. This column, set in a heavy pedestal, is firmly anchored to the main frame. The boom is furnished with either a hand or motor slew as desired.



Portable Electric Crane with Telescoping Boom

Portable Electric Twist Drill Grinder

EFFICIENT work at a rapid rate by unskilled workmen is a feature of a portable electric twist drill grinder called the "Keypower," which is being manufactured by the Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.



New Portable Electric Twist Drill Grinder

The grinding action is produced by light pressure of the drill against the face of the grinding wheel. This light pressure method of grinding permits rapid work, and prevents burning of the steel or drawing the temper of the tool. The tool or drill is held firmly in place by means of a wedge-shaped tool holder that assures uniform results and eliminates the uncertainty of hand application. No water is necessary during the grinding process, since there is a continuous air circulation on the face of the wheel that cools the tool.

A Westinghouse $\frac{1}{4}$-hp. motor provides the motive power. An attachment cord enables the machine to be plugged into any ordinary socket. It is capable of redressing all shapes and kinds of edge tools and is fitted for grinding $\frac{1}{4}$ in. to $1\frac{1}{2}$ in. drills.

This device has been found particularly useful by construction gangs and in railway repair shops and yards, due to its portability, the machine weighing only 60 lb. With it tools can be ground right on the job. A heavy hood over the grinding wheel gives ample protection to the operator.

The News of the Industry

Relief Sought for Continuation of Tri-City Operation

Relief measures which the Tri-City Railway of Illinois expects to ask of the Illinois Commerce Commission have been disclosed to the municipal government in a conference between members of the City Council and railway officials. These measures are:

1. Further extension of service by buses instead of track construction and electric line extension.
2. Increase of approximately 40 per cent in fares through the abandonment of the identification card and 5-cents-a-ride plan and the substitution of the 10-cent fare with three rides for 25 cents.
3. Arbitration of employees' wages on the basis of the company's ability to pay rather than the demands of the unions.
4. Abandonment of certain lines on streets where repaving is contemplated by the city, including Fourth Avenue west of Fifteenth Street.

The traction lines were represented by President R. B. MacDonald and T. C. Roderick, general manager. If relief is not secured the company states that it will not be able to continue to operate the railway in Rock Island and Moline. Figures presented by the company showed a deficit in 1924 of $12,323. Gross earnings were $755,622, operating expenses and taxes $767,946. Last year the number of revenue passengers carried on the Illinois lines was 10,574,361, whereas in 1923 it was 11,761,675. In 1920 the number of passengers carried was 16,842,215.

The report of the traction company also indicates that in the last five years the company failed by $1,358,977 to earn the amount allowed it by the State Commerce Commission, that body's findings allowing a return on investment of $315,000 annually.

Trainmen are at present receiving a wage of 58½ cents an hour. Their wage contract expires on June 1, 1925, and their working agreement contract expires June 1, 1926.

Decline in Traffic in Baltimore Explained

Elimination of certain fare zones in Baltimore, Md., and the increased use of the automobile are held to be largely responsible for a decrease in traffic in Baltimore, according to a statement issued by the United Railways & Electric Company. The company feels that the increase in fare put into effect last June has been a negligible factor in the decline. In support of this claim statistics are cited from other cities in which there have been no recent increases. They disclose that the decline has been greater than in Baltimore.

In making comparisons the company cites that in January, February and March of this year the total number of revenue passengers was 55,599,351, compared with 58,770,572 for the corresponding period of 1924. It is stated by the company that this difference of approximately 3,000,000 is an apparent difference so far as individual car riders are concerned. It is a difference largely due to the fact, it is claimed, that since June, 1924, many Baltimore passengers have paid one fare less than they did before that time because of fare zone extensions made at the time the 7½-cent fare became effective. In other words, there are now many lines on which patrons formerly counted as three revenue passengers, but on which they count now as only two, and there are others that have been reduced from two to one. The company says that a fairly accurate estimate of the loss in revenue passengers due to these changes in zones and fares is 2,075,083, making the comparable figures 58,770,572 for 1924 and 57,674,434 for the first three months of this year, a difference of 1,096,138, or 1.86 per cent, compared with a loss of 4.04 per cent for the eight cities chosen for purposes of comparison.

Ruling Hits Taxis

West Virginia Decision Enjoins Taxi Men from Soliciting Business Along Railway Route Between Princeton and Bluefield—Argues State Must Protect Public Servants—Over-rules Former Decision

WHAT is said to be the first decision of its kind not only in West Virginia, but in the United States as well, is that in which the Supreme Court of West Virginia has awarded an injunction to the Princeton Power Company against C. K. Calloway and two other taxi drivers enjoining them from soliciting passengers along the electric railway lines of the company between Princeton and Bluefield, W. Va. The Circuit Court of Mercer County had handed down a finding in favor of the taxi drivers, but the Supreme Court over-rules the lower court.

The Supreme Court in its finding held that the policy of the state as evidenced by the road law and by the statutes relating to the Public Service Commission was not to invite or encourage ruinous competition between public carriers, but on the contrary was intended to protect such public servants in the enjoyment of their rights so that the public might be served more efficiently and economically. With the burdens and duties thus imposed upon a carrier and public control thereof established by law, the Supreme Court believed that the state was under the moral, if not the legal, obligation to give reasonable protection consistent with the public weal to the rights and franchises of such public service corporation. As evidence of the protection which the state intended giving public carriers with permits under the state road law, the act of 1923 amending the state law of 1921 provided that no such permit should be issued until it had been established to the satisfaction of the commissioners that the privilege is necessary or convenient to the public, and that this service is not being adequately performed by any other person.

The court ruled that if the plaintiff instead of operating an electric railway was engaged in operating a bus line over this highway between these terminals under a certificate of convenience, there would seem to be no doubt about its right to protect by injunction its business against unlawful interference; that the plaintiff in this case held a license to operate its electric railway between certain cities, and at great expense had constructed its line and procured the necessary equipment of cars and devoted its capital and property to the public use. It had thus placed itself under the power and control of the Public Service Commission and of the courts to require of it proper and adequate service for the public.

The court reviewed the charges of the company and answers of the respondents. The Princeton Power Company sought injunctive relief on the ground that such operation meant irreparable injury to it and was illegal because no certificates of convenience for such operation had been authorized by the State Road Commission. The plaintiff alleged that the defendants were not entitled to operate automobiles for carrying passengers for hire over fixed routes and between fixed terminals and in opposition to the railway business; that defendants had no certificates except as incident to their general taxicab business, but that, in violation of the rules and regulations promulgated by the State Railroad Commission, each of them had been engaged in the business of operating automobiles over the highway between the cities of Princeton and Bluefield. By this means these taxicab drivers were carrying a large number of passengers, depriving the Princeton Power Company of said business and the compensation therefor, the rate charged by the defendants being 50 cents instead of 40 cents charged by the plaintiff for the same service.

The taxi men made certain admissions, but denied that the Princeton Power Company was furnishing adequate transportation facilities for the transportation of passengers between the cities of Bluefield and Princeton, and also denied that its vehicles were fully adequate for said purpose. They admitted that they had no permit or certificate authorizing them to operate their cars over the regular route between the fixed terminals, and that no other person or corporation had any such certificate or permit, and as the State Road Commission had not established any regular route over and along said highway, the same was open and free to all persons having licences to operate taxicabs and other vehicles.

In conclusion the court said:

> The defendants, with licenses to operate jitneys only, and who have never obtained certificates of authority to operate buses between the fixed terminals of the plaintiff, nor given bond or otherwise qualified to serve the public served by the plaintiff nevertheless declare their purpose and right to continue their unlawful practice of running their jitney cars over the public road between said terminals, regardless of the rights and obligations of the plaintiff. For this the authorities hold they may be enjoined. Our conclusion is to reverse the decree below, and to enter such decree here as we think the Circuit Court should have pronounced, enjoining the defendants and each of them, until they shall have acquired authority and have certified so to do in the manner provided by law, from operating their cars along or over the public road between the cities of Princeton and Bluefield, or any substantial part thereof, except as may be necessary to travel the same as incident to their ordinary taxi business, and from soliciting patrons or business at either of said terminals, or at any point along the said road, with intent of carrying persons or property regularly over said road or substantially the same route.

Fact-Finding in P.R.T. Fare Case

J. Rowland Bibbins has been retained by the city of Philadelphia to make a detailed study of the transit situation in connection with the fare determination now pending before the Pennsylvania Public Service Commission. He will aid the City Solicitor, Joseph P. Gaffney, in concluding promptly the city's final presentation before the commission.

Mr. Bibbins is at work with a specialized force of engineers and accountants to ascertain the basis facts of physical condition, operation, expenditures and revenue requirements as affecting the adequacy of the company's present budget appropriations and rates of fares.

The findings of facts presented from Mr. Bibbins' examination are expected to provide the basis for a reconsideration of the normal requirements of the property both for present and near future and bring the questions at issue to an early conclusion. At the last commission hearing full city-company co-operation to this desired end was offered and accepted.

While the commission has temporarily authorized the present fare, final decision rests upon the conclusion of hearings scheduled to begin this July.

Will Rehear International Railway's Rate Case

The New York State Public Service Commission has indicated it would approve an application by the International Railway, Buffalo, for a rehearing of the rate case which recently authorized the traction company to increase its fares from 7 cents to 8 cents or two tokens for 15 cents. The commission indicated that formal action on the company's application would be taken early in June.

The International now contends that after a thorough tryout of the 8-cent fare or two tokens for 15 cents, the revenue is still insufficient and a higher rate of fare should be had if the company is to restore its credit standing and pay its bond interest.

The James H. McGraw Awards for Electrical Men

To encourage individual initiative and creative thinking among electrical men, James H. McGraw, president of the McGraw-Hill Company, Inc., New York, publisher of the ELECTRIC RAILWAY JOURNAL, has established four annual awards, three to be competed for by the men of the manufacturing, jobbing and contractor-dealer branches of the electrical industry, respectively, and the fourth to be open, in addition, to men of the central-station industry.

The awards will be presented in the first three instances to that man in each field who is judged to have made the most important personal contribution to improvement or progress in the advancement of either the processes or practices or policies of manufacturing, jobbing, contracting or merchandising. A fourth award will be given to that electrical man in any of the four branches of the industry who has contributed the most valuable and useful idea for promoting co-operation between any two or more branches.

No separate award is made to men of the central-station industry exclusively, in deference to the fact that this field is already covered by the James H. McGraw prize and other annual awards, presented each year at the convention of the National Electric Light Association.

Each award will take the form of a bronze medal and a purse of $100 in gold. The Society for Electrical Development has been requested to act as sponsor for these awards and appoint a committee to prepare an appropriate medal and conduct the contest.

The first competition for these four McGraw awards will close on Sept. 1, 1925. Candidates must submit their statements not later than this date, addressed to the James H. McGraw Awards, in care of the Society for Electrical Development, 522 Fifth Avenue, New York City. Subsequent awards will be presented annually.

Any man of the electrical industry who feels in doubt as to whether a certain idea or service rendered is applicable or eligible for entry for the award is invited to communicate directly to the James H. McGraw Awards, in care of the Society for Electrical Development, 522 Fifth Avenue, New York City.

The committee of awards appointed by the Society for Electrical Development includes: W. W. Freeman, president Union Gas & Electric Company, Cincinnati, Ohio; H. B. Crouse, president Crouse-Hinds Company, Syracuse, N. Y.; W. E. Robertson, vice-president Robertson Cataract Electric Company, Buffalo, N. Y.; L. K. Comstock, president L. K. Comstock & Company, New York, N. Y.; F. M. Feiker, vice-president the Society for Electrical Development; Earle E. Whitehorne, commercial editor ELECTRICAL WORLD.

U. S. Supreme Court Decides Joint Rate and Transfer Case

The United States Supreme Court on May 25 affirmed the decision of the lower courts in granting an injunction to the Belt Line Railway Corporation, New York City, against enforcement of an order of the Public Service Commission (now the Transit Commission) establishing joint routes on the street railways of New York City and prescribing 5 cents as the maximum fare to be charged.

The case at issue involved transfers. The decision declares that receipt of only 2 cents for a passenger carried on a transfer by the complaining corporation is confiscatory.

J. H. Banton, District Attorney, the county of New York, the State of New York and the Transit Commission appealed from the decision of the lower courts. The Belt Line Railway Corporation is a minor carrier, operating the 59th Street line. It resisted an order of the Public Service Commission establishing joint routes and maximum fare in 1912. After a hearing when proceedings were started in 1920, the Transit Commission declared a 7-cent fare on joint routes proper, but the Belt Line applied for a rehearing, alleging that rate confiscatory, but before the rehearing was completed applied for the injunction.

The Supreme Court, in an opinion by Justice Butler, declares the evidence shows that passengers cannot be carried on transfer for 2 cents and that a rate of this kind is confiscatory.

Five Cents More Asked by Chicago Men

Negotiations have begun between the Chicago Surface Lines and their 18,000 employee members of the union for a new wage scale. The men demand a 5-cent increase. The company offered counter terms carrying a scale of 5 cents less than the 1924-1925 contract. The present basic wage is 75 cents and the men want 80, a restoration of the peak scale of 1922.

Besides the wage increase the men ask for an insurance plan to be paid for by the company and request that all night runs end at 6 a.m.

The company countered with an offer regarding working conditions, but the scale suggested was that of 1923, or 70 cents an hour. It was pointed out that the difference in wages and revenues since then have gone against the company more than $2,000,000 in the fiscal year ended in February, 1925.

Other terms suggested were:

Week day runs to be as near eight hours as possible; time and one half for all time over nine hours.

Night car runs shall be straight and as near eight hours as possible.

Allowances to be paid on basis of straight time only.

Percentage of straight runs to be readjusted.

Meal fall back allowance to be 20 minutes.

Negotiations are likewise going on between the elevated lines and their employees, but the outcome there will follow closely the results of the Surface Lines settlement.

Spartanburg Favors Street Cars

By a vote of 690 to 382 the citizens of Spartanburg, S. C., recently decided against the adoption by the City Council of an ordinance to release conditionally the South Carolina Gas & Electric Company from the franchise requiring it to operate electric railway cars.

The vote at the election requires that the concern rehabilitate its railway in accordance with the terms of the franchise granted by the city to the original company about 30 years ago.

The ordinance drafted by the City Council provided that the company be relieved of the necessity of operating cars on condition that it remove its tracks and bear the expense of repairing and paving that portion of the street lying between the tracks and 18 in. on either side. In addition the railway company was to provide a bus service. The South Carolina Gas & Electric Company, recently bought by the W. S. Barstow Management Association, is at present operating one railway line, supplemented by bus service extending all over the city.

Several years ago the company, before it was taken over by Barstow, discontinued railway service in the city. Litigation was instituted by the city and carried under appeal into the United States Supreme Court. Following the purchase by the W. S. Barstow Management Association the company dropped its appeal and assured the City Council that it would restore railway service if litigation were stopped. The proposition was accepted by the city.

Some months ago the South Carolina Gas & Electric Company began operation of a single street car line which runs from Morgan Square out East Main to Pine Street and out Pine Street to East Spartanburg, thence to Clifton. The line was supplemented by bus service covering practically the rest of the city. At a meeting of the City Council several weeks ago it was decided in view of the rehabilitation program to call a special election to determine whether the utility should be allowed conditionally to run buses instead of street cars or be required to restore electric railway service on all city lines.

Department of City Transit in Pittsburgh to Supervise Utilities

The creation of a City Transit Commission in Pittsburgh, Pa., to be appointed by the Mayor subject to the approval of Council, is provided for by the recent approval by Gov. Gifford Pinchot of the bill of Representative Little, Allegheny. The measure gives the Council the right by ordinance to create the Department of City Transit and specifies the term of appointment of the five members of the commission. The department is to have the power to design, construct, manage, and supervise all transit facilities purchased, leased, located, constructed or otherwise acquired, equipped, owned, used or operated by the city. The facilities are to include both subway and ground operations and all parts of the general equipment of transportation companies. The commission is directed to carry into effect the laws of the state and the ordinances of the city pertaining to transit facilities and shall from time to time make its recommendations to the Council for the improvement and development of facilities for transportation of persons and property within the city. Engineers, draftsmen, designers and technical employees may be appointed whether or not they are residents of the city.

Drops $100 in Detroit Fare Box to Make Up Deficit

One of the routes in Detroit on which bus service has been installed as a substitute for a shuttle trolley line is on Dearborn Avenue in what is known as the Delray district. On this route an electric car ran back and forth on a single track to connect two through electric lines on adjoining avenues. This meant one or two transfers for practically every passenger, and the Delray Business Men's Association asked the Department of Street Railways to see what could be done and agreed to repay the deficit for a better service. After a traffic survey, the department decided to extend its Port Oakwood coach line so as to give through service over this section of Dearborn Avenue, and the shuttle trolley car was withdrawn.

On April 1, 1925, after about a month of bus service, the president of the Business Men's Association deposited two $50 checks in the fare box of one of the buses, in confirmation of the agreement to make up the deficit incurred by the extension of this service.

Dissension in Boston Over Arbitration Method

The time arriving for a change in wages and working conditions, if there are to be any, the carmen's union of the Boston Elevated Railway, Boston, Mass., has filed its demand for a substantial increase in wages. In the ordinary course of events these demands would go to arbitration, for the public trustees do not propose to pay the increase. The agreement provides for arbitration. Such arbitrations in the past have resulted in compromises, and increased pay.

This year the Boston Elevated has asked for a change in the method of arbitration. It suggests that the company nominate five men, from among whom the union shall select one to represent the company, and the union to nominate five men, of whom the company shall select one to represent the union, and the two men so selected shall choose the third arbitrator.

The union refuses to accept this form of arbitration and has decided to hold to the system that has been used for a dozen years. In accordance with that decision it has selected James H. Vahey to represent it again. Mr. Vahey has been its counsel and arbitrator for many years. The Elevated has selected Roland W. Boyden as its repersentative. Mr. Boyden was the United States government's unofficial observer at the Reparations Commission conferences in Europe. These two men will select the third man to sit with them if the new wage proposition has to be arbitrated in the old way.

New York Central Suggests Use of Diesel Locomotive

The New York Central Railroad, which has been ordered by the Public Service Commission of the State of New York to carry out extensive electrification projects on certain of its lines entering New York City, has presented a petition to the commission intimating that the road has a method of solving the elimination of steam locomotives in a way other than by electrification.

The railroad says that development of the internal combustion engine for use as motive power for railroad operation has now reached a stage that promises a practical solution of the problem of substitution for steam locomotives a method of propulsion which eliminates many, if not all, of the objectionable features of steam railroad operation while retaining its effectiveness at an expense of installation and maintenance below the present cost of installing and maintaining any system now known which uses electricity as the propelling energy.

It is estimated that on one division installation of the third-rail system would cost $9,000,000. Since the electrification order, the New York Central has been investigating the Diesel-electric engine now on test in the Baldwin Locomotive Works. Officials of the road have inspected the engine and it is understood have made preliminary arrangements to purchase a number of the new locomotives. They contend that the new motive power is particularly adapted to use on the Putnam Division.

The last order of the Public Service Commission of the State of New York, issued April 30, was in effect that New York Central shall by July 1, 1925, submit to the commission a statement of the details of plans of electrification of the main line Putnam Division and Saw Mill River Road branch north of the Yonkers branch. Further interest of the road in connection with the Diesel-electric locomotive is directed toward the west side improvement along Riverside Drive.

Wage Agreements in Illinois Cities

Railway employees of the Illinois Power & Light Corporation, operating in Bloomington and Normal, Ill., have accepted the wage scale of 51 cents an hour tendered by E. O. Brown, general manager, representing the company. There were three dissenting votes to the acceptance after a conference which lasted several hours. Prior to April 30 the scale averaged 49.625 cents an hour.

Similarly after a conference employees of the company at Peoria, Ill., have agreed upon a 5-cent an hour increase for trainmen and motor coach operators and a 2-cent increase for shop men.

The scale is retroactive to May 1 and will be in effect a year. It adds about $25,000 annually to the labor overhead. The maximum pay will be 55 cents under the new scale. The men sought a 10-cent increase. The company offered a 2-cent raise.

Rehearing on Tax Issue Denied City of Seattle

The city of Seattle, Wash., recently lost another point in its opposition to the payment of three-fourths of the 1919 taxes of the Seattle Municipal Railway system, purchased in that year from the Puget Sound Power & Light Company, when the United States Circuit Court of Appeals at San Francisco denied the city's appeal for a rehearing. The court had recently decided that the traction company's claim constituted a cause of action in equity and must be tried on its merits. Unless the city asks a writ of certiorari in the United States Supreme Court the power company's action to recover three-fourths of the taxes will be heard in the federal court in Seattle.

The appeal that was made for a rehearing was on the ground that the court passed on issues that were not before it. The amount involved, with interest, is approximately $650,000.

Men Seek Arbitration

William O. McGowan, chairman of the union's joint conference board, recently announced that the men employed in the twelve divisions of the Eastern Massachusetts Street Railway, Boston, Mass., had voted to reject an offer made by the company in answer to its request for a wage increase. The men have decided to ask for arbitration.

Demands made by the men for higher wages and better working conditions have been the subject of conferences for some weeks now. The men are asking an increase in wages from the present rate of 54 cents to 70 cents, as the basic rate, and a differential of 8 cents in favor of the one-man car operators. The new scale, if a new one is awarded, will be retroactive to May 1, the date of the expiration of the old agreement.

Binghamton Paper Wants Franchise Settlement

The Binghamton *Press* is pulling for a new franchise for the Binghamton Railway, Binghamton, N. Y. It seems that the Binghamton Railway has been living from year to year. Yes, living from year to year. Theoretically the company and the city are in mortal combat, but practically all is harmony. The city is jealous of its supposed rights over the matter of fares, and so while it has from year to year permitted the increased fare to be charged, the case on its merit is before the courts. It has, in fact, been there six years. In a recent issue the *Press* said editorially:

> The question to be determined is whether (under the original franchise fixing a 5-cent fare) the city still retains the right to determine what the fare shall be or whether this right may be exercised by the Public Service Commission without approval by the city.
>
> If the Appellate Court sets aside the writ of prohibition and a trial court decides that the Public Service Commission has exclusive authority over the fare that may be charged the railway will be in a position to go ahead with its plans for financial reorganization.
>
> If the city has that right, the situation will not be so simple. For the city has been granting an extension of fare for only one year. It might refuse to renew the 7-cent fare agreement.
>
> Such a refusal, in our opinion, would not be justified. But as long as it remains possible capitalists are going to be slow about investing money in the local company.
>
> The interests of the city and the interests of the street car company are to a large extent identical. The people of Binghamton want to deal fairly by the company. They must do so if they are to get the service they require.
>
> But it is hardly just to the company to ask it to accept a fare agreement running for only one year. And if the city wins its case in the higher court (as we hope it will) some arrangement ought to be made, a new franchise if necessary, that will protect the rights of the city and will strengthen the financial position of the company.

"Now, My Idea Is This!"

Guy C. Hecker, special engineer of the American Electric Railway Association, attained to the editorial page of the New York *Evening Post* on May 25 in one of that paper's "daily talks with thinking New Yorkers on subjects they know best." His subject was "Standardization as It Affects Our Electric Railways." He told about the comprehensive program of standardization that has been carried on since 1906 under the auspices of the American Electric Railway Engineering Association.

There is nothing particularly new to the industry in this review by Mr. Hecker of the work that has been carried on, but it was an achievement on his part to be able to bring the work to the attention of the general public, and then to do it as clearly and forcefully as he did in the interview. On the general subject of standardization Mr. Hecker said:

> There can no longer be any question of the vital necessity, not only in the electric railway and railroad industries, but in all industry, for co-operative effort on a nation-wide scale to bring about simplification and standardization, with its enormous possibilities for lower cost of production.
>
> The railroads and electric railways are the arteries and veins of the country. Upon the intelligent and economical expansion of these facilities depends, to a great extent, the future progress of the nation. These vital industries can effect economies through standardization which will contribute materially to the progress and growth of the nation's business and social life.

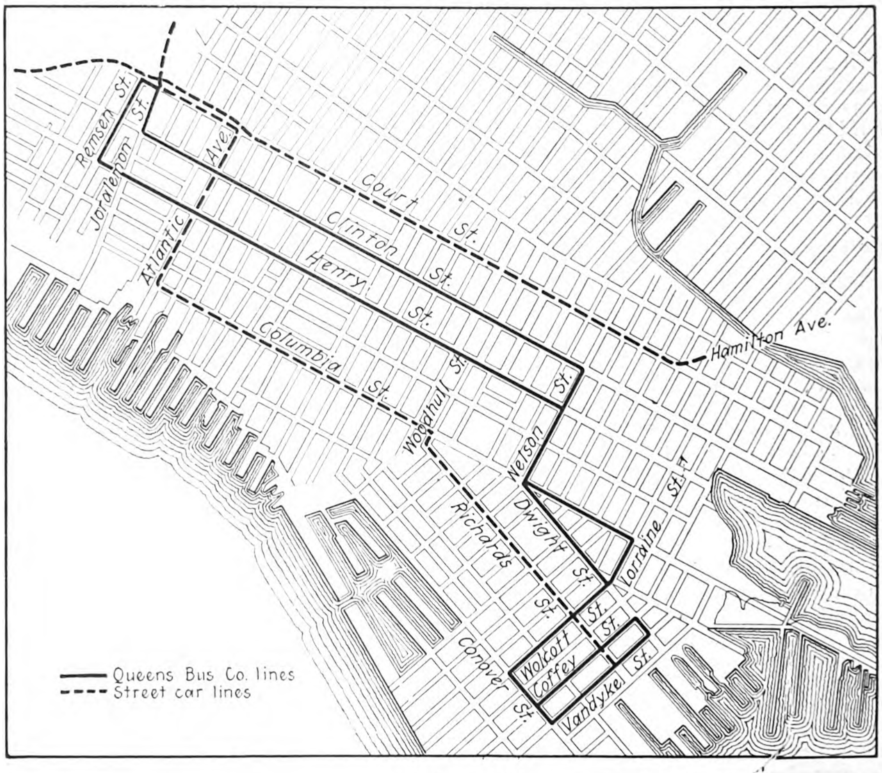
Compromise in Freeport Results in Franchise Adoption

Two years of strife between the Illinois Northern Utilities Company and the City Council of Freeport, Ill., has ended with the adoption of an ordinance granting to the company a railway franchise covering a term of twenty years. The company has been operating for two years without a franchise on all of its lines except the Homer Street extension. The company has refused to accept a franchise which required it to pave between the rails.

A compromise was reached whereby the company agrees to pay for the foundation for the pavement between the rails.

Three Brooklyn Roads Enjoin Bus Company

The Brooklyn City Railroad, the Coney Island & Brooklyn Railroad and the Nassau Electric Railroad have secured from Supreme Court Justice John MacCrate, Brooklyn, a temporary injunction to restrain the Queens Bus Lines, Inc., from operating two bus lines in competition with surface lines of the three companies. The restraining order was obtained on Friday, May 22, was served at once and the following day at 2 p.m. the bus line withdrew service. The case is returnable on June 1. The bus lines run from Borough Hall to Erie Basin and Park Circle to Erie Basin. William N. Dyckman, representing the Brooklyn City Railroad, alleged that the bus lines were being operated without a permit from the Board of Estimate or a certificate of convenience and necessity from the Transit Commission.



Territory in Downtown Brooklyn in Which Competitive Bus Service Has Been Restrained

Recent Bus Developments

Indiana Interurban Develops Intensive Bus Program—Activity Reflected in More than a Dozen Other Items

INDICATIONS that the Union Traction Company of Indiana plans to enter the bus field somewhat more extensively than heretofore were seen on May 14 in petitions which the company filed with the Public Service Commission. One petition asked for permission to abandon car service on three city lines in Muncie, another asked for authority to supplant railway service with bus service, a third sought permission to operate a bus line between Indianapolis and Kokomo, and the fourth was an application for permission to operate a bus line from Indianapolis to Muncie. Both of the overland routes parallel interurban lines operated by the company between the same points. Each petition was filed in the name of Arthur W. Brady, receiver.

The three Muncie lines which the company seeks to abandon are the Avondale, Beacon and West Side lines. The ground for the abandonment set out was that the cost of operating the lines several months had exceeded the gross revenue and that serious deficits had been incurred. The low earning power of these lines in the last three years had been due to the operations of "jitneys" in the streets, the petition said.

The applications for bus lines in each case asked for beginners' permits. In the case of the Muncie city lines the traction company set out that it would operate in competition with three present operators, who, the traction company's petition contended, are operating illegally and without right either under statute or city ordinance. Sixteen buses are to be acquired for use on the three city lines. In regard to the Kokomo line the company said it would operate six buses and would compete with three bus companies.

Further expansion of its bus system is planned by the New York State Railways in the application of its subsidiary, the Rochester Railway Co-ordinated Bus Lines, Inc., to the City Council for permission to operate a bus line in north side suburban and city territory, to connect with the proposed Irondequoit line and to intersect four city railway routes. This application follows appeals for the route by residents of the territory. The plea for a franchise asks for the right to run either buses or trackless trolleys. It is expected that buses will be installed first, and later, if traffic conditions warrant, they will be supplanted by trackless trolleys. The railway now operates successfully a crosstown trackless line over the Driving Park Avenue bridge.

The Twin City Motor Bus Company, auxiliary of the Twin City Rapid Transit Company, Minneapolis, Minn., has applied to the State Railroad and Warehouse Commission under the new bus control law for retention of its present bus routes from St. Paul to White Bear and Bald Eagle, Minn.; St. Paul to Dellwood via Glouster; St. Paul to White Bear, Minn.; St. Paul to Lake Elmo and Stillwater; also a bus line between Glen Lake and the Minnetonka suburban line of Minneapolis, which is operated to carry electric railway passengers on transfer to and from Glen Lake Sanitarium. The company has also applied for maintenance of its interurban line on University Avenue between Minneapolis and St. Paul, 11.2 miles, and for a new route on Lake Street and Marshall Avenue, 11.5 miles, which in part is the same route as that already maintained by an independent bus company, between the business centers of the two cities. The Twin City Rapid Transit Company is considering the question of operating ten double-deck buses from downtown to the city limits on Nicollet and Lyndale Avenues. The route must be approved by the City Council, and then by the State Commission.

The Capital Traction Company, Washington, D. C., recently applied to the Public Utilities Commission of the District of Columbia for permission to run a bus line with a 25-cent fare from Chevy Chase to the Capitol. The company plans to operate on a 20-minute schedule buses accommodating between 30 and 35 passengers. The company will also apply for a permit to operate a bus looping through Chevy Chase, D. C., as a feeder for the Connecticut Avenue car line with an 8-cent cash fare, six tokens for 40 cents and 2 cents additional for a transfer to the street car.

Members of the City Council of Dubuque, Iowa, have approved the Dubuque Electric Company's plan for the operation of buses to supplement its electric railway service in sections of the city not reached by railway lines. A fare of 10 cents will be charged. There will be no interchange of transfers between the two modes of transport. The new service will be distinctly separate from the traction system. Investment in the new service will be about $50,000. Pay-as-you-enter buses of 25 or 29-passenger capacity will be used. The system will probably be in operation June 20.

Franklin T. Miller, receiver of the Boston & Worcester Street Railway, has been authorized by the Massachusetts Supreme Court to operate bus lines in Boston, Waltham, Newton, Marlboro, Worcester, Ashland, Brookline, Grafton, Hopkinton, Hudson, Natic, Northboro, Shrewsbury, Southboro, Sudbury, Watertown, Wayland, Westboro and Weston.

The Board of Public Utility Commissioners of New Jersey recently approved the application of the Public Service Railway to suspend service on a portion of the Governor Street line in the city of Paterson conditionally on the substitution of five buses to serve the Governor Street route. The city of Paterson, the Public Service Railway and the Public Service Transportation Company agreed that bus service be substituted for trolley service.

Notice has been given by the Indiana Public Service Commission of a hearing at Indianapolis on the application of the Chicago, South Bend & Northern Indiana Railway for authority to operate a bus line from South Bend to Michigan City. The line will pass through the towns of LaPorte and New Carlisle.

Formal approval has been given by the New Jersey Board of Public Utilities Commissioners for the abandonment of electric railway service by the New Jersey Interurban Company between Phillipsburg and Port Colden, N. J., and the substitution therefor of a bus service by the New Jersey Interurban Coach Company between Phillipsburg and Hackettstown. Service on the line, which has been in operation about twenty years, was discontinued last January as the result of heavy snowstorms.

Through interstate bus service was established May 20 between Indianapolis and Louisville by the Interstate Public Service Company. Two buses will leave each terminal daily. The service parallels the Interstate company's traction lines. Passengers bound for the terminals will be taken on at any intermediate point, but none will be taken on at the terminals for any of the intermediate points. For several months the railway has been operating a bus line between Indianapolis and Franklin and only recently bought the competing Jackson Highway line to Franklin. It has for a short time been operating buses to Seymour, touching Greenwood, Franklin, Edinburg and Columbus, and had a line between Scottsburg and Jeffersonville.

The Boston Elevated Railway, Boston, Mass., is charging a 6-cent fare on all its buses where formerly the charge was 5 cents. General Manager Dana secured approval of the 6-cent fare from the authorities in all the cities and towns in which the company operates. Many of the city authorities objected at first, but have since withdrawn their opposition.

The Des Moines City Railway will operate a system of passenger, freight and express buses to various points in central Iowa, if a proposed line to Newton proves a success, President Frank C. Chambers recently stated. The Des Moines & Central Iowa Railroad, a subsidiary of the company, was granted a permit to operate to Newton, Mitchellville and Colfax.

After a survey of traffic conditions between Baltimore and Washington, officials of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., have decided not to install any bus equipment for use on the Washington Boulevard between Baltimore and Washington. George T. Bishop, president, said that it was quite evident that a bus line between Baltimore and Washington would be operated at a loss. He further stated that the decision did not mean that the company had discarded the idea of using buses to supplement its regular train service, but that, on the contrary, the company expected to install buses as feeders to its railroad lines wherever public convenience required them.

Sale of Tickets Withdrawn at Youngstown

Tickets which were being sold by the Youngstown Municipal Railway, Youngstown, Ohio, so as to provide 25 rides for $1.25 have been withdrawn after a trial period of three weeks. From the test made with them it appeared the sales would not justify any expectation of building traffic. The idea behind the plan was to restore in a measure the 5-cent fare. It was distinctly stated at the time the tickets were put on sale that the plan was an experiment. No transfers were issued on fares paid by use of the ticket. During the time of the experiment there was no change in the rate of fare which had existed previously, namely, 8 cents cash or seven tickets for 50 cents, with a 1-cent charge for transfer on either cash or ticket fare.

Taxicab Ordinance Recommended for Los Angeles

Steps to eliminate cruising taxicabs from the downtown section of Los Angeles have been taken by the public safety committee of the City Council in recommending adoption of a new taxicab ordinance. The new measure is intended to give the Board of Public Utilities jurisdiction over the "for hire" automobiles and taxicabs. Designated stands in the downtown district will be assigned to taxicabs under the new plan. The present stands are assigned only in the outlying districts. Use of the stands would be prohibited during the no-parking period between 4:30 and 6 p.m.

Higher Fares Sought in East St. Louis

The East St. Louis & Suburban Railway, East St. Louis, Ill., has applied to the Illinois Commerce Commission for authority to increase its rates in the city of East St. Louis. The present cash fare is 8 cents, two tokens for 15 cents and four tokens for 30 cents. The company seeks to raise the cash fare to 10 cents, but would continue to sell four tokens for 30 cents if the application for the new rates is granted.

W. H. Sawyer, president of the company, said that the increased fare is needed to offset loss in patronage due to increased automobile traffic. He said that about 75 or 80 per cent of the patrons purchase tokens and that the requested increase would affect only the occasional rider who purchased a single fare. The effect, as a result, would be only moderate, and the application was considered necessary by the company because automobile traffic had decreased the car traffic approximately 5 per cent. The added income would barely equal the loss, he believed.

Fares Increased.—Street car fares in Ames, Iowa, have been increased from 5 to 7 cents by the Fort Dodge, Des Moines & Southern Railroad. The company, however, has conceded the sale of seventeen tickets for $1. C. H. Crooks, president of the company, said increased operative and fixed charges made the fare advance necessary.

News Notes

Token Carriers for Sale.—The International Railway, Buffalo, N. Y., is selling thirteen tokens and a metal token carrier for $1. Passengers are told by the railway that these token carriers cost about 4 cents each in large lots, but that they are being sold below cost to facilitate the handling of tokens. The company reports that an unusually large number of passengers are buying their tokens in $1 lots rather than two for 15 cents as heretofore.

Higher Fare Permitted.—Following a hearing on Jan. 28, at which both sides were represented, the North Carolina Corporation Commission recently granted in part the petition of the Tidewater Power Company for increases in city and suburban railway fares in and near Wilmington. The commission granted requested increases of 5 cents on most of the suburban lines out of Wilmington and modified a request for an increase within the city. The company was permitted to change its fares from 7 to 8 cents instead of from 7 to 10 cents. Four tickets will be sold for 30 cents, which was also proposed under the 10-cent fare. A request to sell a weekly pass for $1.25 was also allowed.

Lower Fares for Washington, Pa.—To encourage more short-haul travel, the Pittsburgh Railways reduced fares on May 18 on its Washington local lines from 6 cents to 5 cents cash and cut the price of the weekly pass from 95 cents to 75 cents.

Electric Car for Economy. — As a means of reducing operating costs on its branch line, the Halifax & Southwestern Railway has decided to install electric service between Lunenburg and Mahone Junction.

Pottsville Adopts Weekly Pass.—The East Penn Electric Company was to establish on May 25 the weekly pass in Pottsville, Pa., at the cost of $1.25, against a cash fare of 10 cents and a token fare of 8⅓ cents. An important change is to be made in the manner of selling tokens. Instead of offering them at twelve for $1 through a single sales place they will be available on the cars at three for 25 cents.

Increased Fare Proposed. — The Rochester, Lockport & Buffalo Railroad Corporation, Rochester, N. Y., has filed with the Public Service Commission a new local passenger tariff, effective June 16, proposing an increase of ¼ cent a mile in commutation fares, cash ticket fares and mileage book price. The redeemable excess fare regulation is changed so that excess charge will be made on fares over 12 cents instead of 16 cents. In a statement accompanying the tariff the corporation states that its passenger revenue for the year 1924 showed a decrease of $38,000 as compared with 1923 and for the first four months this year a decrease of $8,000 as compared with 1923. In the same time taxes have increased substantially, the statement says. The passenger revenue in 1924 was $396,858, against $434,854 in 1923. For the first four months of the present year the passenger revenue was $136,969, against $145,001 for a similar period in 1924.

New Fares Approved. — The Public Service Commission has approved a new schedule of fares on the lines of the Southern New York Railway, effective June 14. Local fares for 30-trip family tickets, good for transportation of purchaser and member of his family within 30 days from date of sale, are as follows: Between West Oneonta and Oneonta, $3.75; Laurens and Oneonta, $7.50; Index and Cooperstown $2.85; Cooperstown and Fly Creek, $5.75; Cooperstown and Toddsville, $3.75. These rates will be good in either direction between these stations.

One-Man Cars Under Fire.—Considerable pressure is being exerted upon the Portland Electric Power Company, Portland, Ore., to eliminate one-man cars in the congested district. F. I. Fuller, vice-president of the company, has consented to use a "loader" in the loop district to assist passengers to board the cars. Mr. Fuller has protested a ruling that allows autos to park for one hour while street cars are limited to a maximum of three minutes.

Service of 47 Years Commended.—Because of his 47 years in the service of the United Railways & Electric Company, Baltimore, Md., John Lessner, veteran line superintendent, was fêted and eulogized by officials recently. Mr. Lessner, who had been a line superintendent since 1895, was, at his request, relieved of these duties on Jan. 1 and placed in charge of the Park Terminal carhouse, where center several of the lines over which he had exercised supervision for many years. President Emmons and Vice-President and General Manager Palmer spoke highly of his valuable service.

West Penn Applies for Passes.—Application is to be made by the West Penn Railways for a $1 weekly pass to cover local riding in Connellsville and South Connellsville, Pa., against a cash fare of 8 cents and a ticket fare of 6¼ cents. The company also plans to install a Sunday-holiday pass for May 30 or May 31 for 50 cents between any point in Greensburg and either the Trafford City or McKeesport terminus. The regular fare to Trafford City, eight zones from Greensburg, is $1.28 round trip cash fare or $1 ticket rate.

Must Decide on Franchise.—The City Council of Decatur, Ill., has notified the Illinois Power & Light Corporation to give an answer before May 29 on the railway franchise which has been under consideration several months. Terms of the franchise have been practically agreed upon except for sections covering paving of three streets. Unless an agreement is reached soon, the city will not be able to pave the streets this summer. A referendum will be necessary to decide whether a clause for the purchase of the utility will be included and then another referendum upon the franchise proper.

Electric Line to Open Its Summer Resort.—The Denver & Interurban Railroad (Kite Route) will reopen for the season on May 24 its beauty spot in the Rockies, Eldorado Springs, located about 30 miles north of Denver.

Foreign News

Fare Reductions in Britian

In spite of trade depression and widespread unemployment, various British tramway undertakings are reducing fares. Perhaps it is encouraged by the fact that in regard to most of the undertakings (apart from London) traffic receipts as compared with a year ago show a rising tendency. The Torquay Tramway Company has reduced the fare for the three-mile journey between Torquay and Paignton from 3d. to 2d. Sunderland Corporation Tramways has returned to pre-war fares. In Sheffield children under fourteen years of age may now travel the whole length of any tramway route, in some cases more than 4 miles, for a halfpenny. The Glasgow Tramway Committee is recommending to the Town Council the adoption of a maximum fare of 2d. between the center of the city and suburban termini. Halifax is reducing fares by 25 per cent.

Russian Electrification Progressing

A beginning has been made on the program for the development of electrification of the railways of the Soviet Union, according to bulletins received from Moscow by the Russian Information Bureau in Washington. Several of the Moscow suburban lines are being electrified, and also the Suram mountain pass section of the Transcaucasian Railroad, between Tiflis and Batum. In all 94 miles is being completed. An additional 105 miles will shortly be begun, including the electrification of the Leningrad suburban railways. The general electrification program calls, first, for the electrification of suburban and mountain lines and eventually for the establishment of electric trunk lines adapted to the transport of trains up to 7,000 tons.

Urban trolley systems are also increasing their mileage this year. Before the war 35 cities had electric railways. During the World War and the civil wars about half of the lines went out of business. By 1920 fifteen had ceased operations altogether and eight were running only four months of the year. By the end of 1924 the pre-war mileage was restored and lines had been opened in three additional cities. The volume of traffic has doubled in three years, though still somewhat below the pre-war figures. About 1,000 new cars will be needed this year, of which 385 are already being built in domestic factories.

French Company Earns Nearly Four Million Francs

The Compagnie Génerale Française de Tramways, which operates the street cars of Le Havre, Marseilles, Orléans, Nancy and the Cambria-Saint Quentin interurban line, made a profit of 3,799,023 francs as a result of 1924 operation, according to its annual report. Operating agreements in the various cities will come to an end on Dec. 31 next, by virtue of an accord entered into with the various municipalities in 1919.

Only in Le Havre has a definite rearrangement been reached. Here all the fixed property and rolling stock have been kept up to as high a state of efficiency as possible. Advances have been made to the company by the Havre municipality. Extension of the lines and other work is far advanced with a view to more favorable operating arrangements to be made during the present year, before the expiration of existing franchise and the adoption of the new agreement.

At Orléans and Nancy, as well as at Le Havre, salaries of employees have been raised. A corresponding rise in fares has been put into effect and others are in prospect.

The Marseilles lines are to be extended in accordance with an agreement signed with the municipality last year. The question in Marseilles is complex and the service in all respects is arduous. The city itself has started a supplementary bus service, which has given rise to much criticism.

For the Compagnie des Tramways de Cambrai et de Saint Quentin, in the reconstructed war zone, an agreement has been arrived at with the municipality of Saint Quentin for the reconstruction, modification and operation of the line, a large part of which was destroyed during the German occupation. War damage funds have helped to improve the possibilities of this line, which is one of the few interurbans of importance in France.

At the Cambrai end, also in the war zone, the situation is less satisfactory, the demands of the company having been met with indifference. War damages for this terminal have not yet been assessed or even urged by the municipality, although it is said the company expects municipal co-operation. It is possible that there will be an entire reconstruction and a new agreement for the Cambrai section. As it is considered desirable to delay a definite agreement until the line is rehabilitated and construction of the company's own power plant is completed, a temporary agreement to run for two years has been made.

Austrian Hydro-Electric Affects Transport Progress

Exploitation of hydro-electric power in Austria is making notable progress by reason of the potential demands to be made upon Austria's water-power resources by various electric transport schemes. Electric traction has been recently extended to the trains running through the Arlberg tunnel on the international line. The Landeck-Bludenz line will be electrified in the course of the year. Work during the year will include electrification from Bludenz to Buchs and Bergenz to link up the Austrian electric system with that of Switzerland.

Buses Compete with Glasgow Municipal Tramways

Privately owned buses are competing with the municipal tramways and especially with the suburban steam railways. The buses come from the country into the center of the city and return. The strangest part of the matter is that not one of these buses is licensed by Glasgow. That has come about in consequence of the peculiar provisions of the Glasgow police act of 1866 covering stage carriages and stage coaches. The stage carriage is defined as a passenger vehicle running between the city and any place within 5 miles of its center. A stage coach is a vehicle carrying passengers for longer distances. The stage carriage is required to be licensed by the magistrates, but not the stage coach. The latter, however, is forbidden by the act of 1866 to take up or set down passengers within the 5-mile radius. As a fact, the buses do pick up and set down passengers in the city and thus should be licensed.

James Dalrymple, tramway manager at Glasgow, has been trying for some time to get the authorities to prosecute the proprietors of the buses for using them as stage carriages and thus plying for hire without a license. It seems probable that a test case will be brought. If the bus owners then apply for licenses, Mr. Dalrymple thinks that the magistrates, in conjunction with the tramway committee, should lay down the condiitons on which the licenses would be granted. If the bus owners objected to the conditions, the licenses would be refused and the matter placed before the Ministry of Transport.

At Liverpool the problem has been met by the city granting running rights to a company known as Ribble Motor Services, Ltd. Passengers are picked up or set down by this company only within the city at certain specified points, and no passengers are picked up on the inward journey or set down on the outward journey while the bus is traveling within the city boundary. Thus the municipal tramways are protected.

Italian Street Car Lines Produce Little Profit

The Turin Street Car Company, controlled by Belgian capital, produced a net profit for 1924 of only 593,565 lire.

The Naples Tramways met with an operating loss of 204,272 lire, making a cumulated deficit of more than 20,000,000 lire.

The Tramways of Florence produced a deficit amounting to 1,801,552 lire, making a total corporate deficit of more than 20,000,000 lire.

Automatic Ticket Machines.—The London Underground companies have placed an order for 50 automatic ticket machines of an improved design which will still further speed up the issue of tickets to the passenger. Fifty tickets can be delivered by the "press of a button" by the new machines as against five tickets by the older type. Further improvements have also been made in the "dating" mechanism, so that each of these 50 tickets, although issued from the machine almost instantaneously, will be dated as it passes through.

Financial and Corporate

Michigan Road Sold

Operating Officials Take Over the Muskegon Interurban, a 45-Mile Line, for Intensive Development

Sale of the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., by the United Light & Power Company to Sidney L. Vaughan and associates has been confirmed by Richard Schaddelee, senior vice-president of the holding company. The entire interest of the United Light & Power Company will pass to a group headed by Mr. Vaughan and William K. Morley. Mr. Vaughan has been vice-president and general manager of the interurban for several years. Mr. Morley was active manager until a few years ago.

The sale terms were not made public, but it was announced that the outstanding common stock, amounting to $1,200,000, has been acquired by the new owners. The company has outstanding $1,500,000 of first mortgage bonds which mature July 1, 1926.

The new directors are William K. Morley, S. L. Vaughan, Thomas F. Carroll, L. A. Goodrich, G. R. Wilber, H. R. Green and H. P. Rademaker, all of Grand Rapids.

Mr. Morley has been elected president of the company. Other officers are: Sidney L. Vaughan, vice-president and general manager; G. R. Wilber and H. R. Green, vice-presidents; L. A. Goodrich, secretary-treasurer; H. P. Rademaker, assistant secretary and assistant treasurer.

Mr. Carroll has been a director of the company since its incorporation in 1899 and is the corporation's general counsel. Mr. Green, Mr. Wilber and Mr. Rademaker are officials of the United Motor Products Company.

The company was organized in 1899. The road itself was completed two years later and was under Mr. Morley's management for many years. The United Light & Railways Company, later the United Light & Power Company, acquired a controlling interest in the interurban nine years ago. The company has 45 miles of main line trackage connecting Grand Rapids with Grand Haven and Muskegon.

An official statement reads:

> The Muskegon Interurban for years has been a successful company, but has recently suffered, in common with all other interurban companies, from the competition of the privately owned automobiles and more recently from the unbridled competition of the heavily subsidized common carrier freight trucks and buses, which are practically paralleling its route between Grand Rapids and the other terminals.
>
> The United Light & Power Company has been looking for a purchaser of the property for some time and finally found one in Mr. Vaughan and his associates, who hope, by careful management and the exercising of rigid economy, to continue operations, relying on good service and the good will of the territory served to enable them to do a profitable business. W. K. Morley, up to recently the active general manager of the property, and Sidney L. Vaughan, who succeeded him, carry with them the well wishes of the officials of the United Light & Power Company, which has severed all connection with the property.

A few months ago the Grand Rapids, Grand Haven & Muskegon Railway announced that it was the only interurban in Michigan that was not operated under a receivership. At that time it was declared that the courts would be asked to appoint a receiver, but no action has been taken along this line.

The policy of the company will not be changed for the present, officers announce, but Mr. Vaughan is seriously considering attracting business to his line by granting special round trip rates, with one-day privileges. These rates will be lower than the bus rates and are expected to attract considerable business because of the advantage which the interurban holds.

City Attitude at Buffalo Not Liberal

Further negotiations between representatives of the International Railway, Buffalo, N. Y., and the municipal authorities on the proposed city-company plan of service-at-cost depend upon the attitude taken by the company toward the $20,000,000 valuation on the railway property, fixed by the city committee as the basis of service-at-cost negotiations. The city is willing to admit a valuation of $20,000,000 and allow a 6 per cent return on this valuation. The valuation recently fixed by the Public Service Commission as the basis of the 7½-cent fare was $22,000,000. The company claims a valuation of $60,000,000. A 6 per cent return on the $20,000,000 valuation fixed by the city would make possible guaranteed earnings of $1,200,000 annually. The interest on the company's outstanding bond issues is $1,100,000 annually.

Surplus Over Charges Greater on Southern Property

Virginia Railway & Power Company Forging Ahead Consistently—Interesting Railway Statistics in Annual Report—Proposal Advanced for $1,000,000 Bus Program

Gross earnings of the Virginia Railway & Power Company, Richmond, Va., for the year ended Dec. 31, 1924, were $10,454,047, a decrease over the previous year of $54,561, or 0.52 per cent. Operating expenses decreased $93,094, or 0.33 per cent. The gross income from all sources was $3,758,871, an increase of $67,506, compared with the previous year.

The expenditures for maintenance of way and equipment were $853,136, or 17.96 per cent of the gross railway earnings, as against $865,640.89, or 17.28 per cent, for the previous year.

During the year the State Corporation Commission of Virginia assumed jurisdiction over the Petersburg railways and also over the Richmond railways. In the latter case the decision of the commission was affirmed by the Supreme Court of Appeals of Virginia upon appeal taken to that court by the city of Richmond. This places all of the properties of the company under the jurisdiction of the State Corporation Commission of Virginia. According to T. S. Wheelright, the president, it affords a credit base that will enable the company properly to expand and meet the increasing demands for transportation as well as light and power service throughout the large part of the state covered by its lines.

The company now serves about 25 per cent of the population of the State of Virginia. Its light and power lines furnished electric service to 71,759 cus-

INCOME OF THE VIRGINIA RAILWAY & POWER COMPANY FOR YEAR ENDED DEC. 31

	1924	1923
Gross earnings	$10,454,047	$10,508,608
Operating expenses	6,987,270	7,080,364
Operating revenue over operating expenses	$3,466,776	$3,428,243
Other income	292,095	263,122
Gross income	$3,758,871	$3,691,365
Taxes and licenses	812,357	739,666
Income applicable to fixed charges and rentals	$2,946,514	$2,951,699
Fixed Charges and Rentals:		
Interest on outstanding funded debt	$1,288,290	$1,190,522
Interest on car equipment notes	6,000	10,000
Sinking fund payments	224,995	206,288
Norfolk Railway & Light Company rental	99,000	99,000
Miscellaneous interest	20,165	27,525
Total fixed charges and rentals	$1,638,450	$1,533,337
Surplus over fixed charges and rentals	$1,308,064	$1,418,362
Other Charges:		
Proportion of discount and premium on sale and purchase of bonds and other securities	$63,215	$36,025
Net miscellaneous charges not operation charged direct to surplus	27,072	219,042
Total direct charges	$90,287	$255,067
Surplus over fixed and other charges	$1,217,776	$1,163,294
Dividends	$538,405	....
Additional charge to surplus	304,145	....

RESULTS OF RAILWAY OPERATION AT RICHMOND FOR YEAR ENDED DEC. 31

	1924	1923
Revenues—Railway		
Passenger	$4,667,501	$4,927,440
Freight	12,393	12,516
Mail	1,076	1,090
Total car revenue	$4,680,971	$4,941,048
Outside operations	68,072	68,611
Total railway revenue	$4,749,043	$5,009,659
Operating Expenses—Railway:		
Maintenance of way and structures	$457,234	$471,887
Maintenance of equipment	395,902	393,753
Power	286,174	388,781
Conducting transportation	1,577,040	1,611,762
Traffic	7,058	-4,537
General expenses	1,043,725	1,036,574
Total railways	$3,767,135	$3,907,296

tomers during the past year, an increase of 5,165 customers over the previous year, and its railway lines carried a total of 75,580,824 revenue passengers for the year, a decrease of 4,566,845 compared with the previous year.

During the year the property account of the various division was credited with $2,022,028, representing the value of property reconstructed, abandoned and dismantled as unserviceable and other property transferred from one division to another, viz.:

Railway Department:	
Richmond Division	$474,653
Petersburg Division	70,235
Norfolk Division	132,520
Portsmouth Division	460,041
	$1,137,449

Properties constituting the system of the Virginia Railway & Power Company for the fiscal year ended Dec. 31, 1924:

	Total Miles of Single Track
Track Mileage:	
Richmond City	79.333
Henrico County	5.629
Chesterfield County	21.024
Prince George County	0.428
Dinwiddie County	4.250
Petersburg City	8.806
Norfolk City	84.522
Norfolk County	19.673
Portsmouth City	19.681
Total	243.346

In order to supplement its present railway service and meet the increasing demands for transportation, the company proposes to add buses to its equipment and operate a unified service by issuing transfers as between the two types of service, thus enlarging the scope and adding to the flexibility of its transportation system. To supplement the present railway service with bus operation will involve an expenditure of approximately $1,000,000.

Early in the year the company acquired 19,942 shares of a total of 20,000 shares outstanding of the capital stock of the Roanoke Rapids Power Company at a cost of approximately $1,000,000. In the light and power department capital expenditures during the past year amounted to $1,856,634.

Approximately $2,000,000 has been authorized to cover the 1925 construction program, made necessary to safeguard the service and meet the increasing needs of the communities served throughout the system. This amount includes the construction in Richmond of two automatic substations serving the railway and commercial customers in the north and west ends of Richmond, one automatic substation serving commercial customers in the far west end of Richmond, a hydro-electric generating station in South Richmond and the construction of a 110,000-volt transmission line between Suffolk and Roanoke Rapids, at an estimated cost of $800,000, including right of way, to connect the Roanoke Rapids Power Company with the power system of the Virginia Railway & Power Company. In connection with the construction of this line, substations will be erected at Suffolk and at Roanoke Rapids.

The expenditures during the fiscal year ended Dec. 31, 1924, for additions, extensions and betterments to property and charged to capital account were $2,546,556. Capital expenditures in the railway department during the year totaled $492,196. They may be summarized as follows:

Railway Department:	
Richmond Division	$316,636
Petersburg Division	73,417
Norfolk Division	88,141
Portsmouth Division	14,001
	$492,196

Buses Help Interurban Earnings

Operation of buses from its terminus at Winton Place to Cincinnati, Ohio, was partly responsible for the increase in passenger traffic on the Cincinnati & Dayton Traction Company's lines last year, according to the annual report of George P. Sohngen, receiver, filed in the Court of Appeals at Dayton. The increase in receipts over the Hamilton to Cincinnati division was put at $17,724 over those for the preceding year. Elimination of bus competition between Dayton and Middletown enabled an increase of $9,157 over 1923. Hamilton city lines, a part of the system, showed a decrease of $2,127. Gross income on the Hamilton city lines was $213,995 and operating expenses $138,599. The Dayton city lines showed a decrease of $4,178. In both cases where losses were shown traction officials blamed a general depression in business. Five divisions are included in the report. They are the Southern Ohio and the Dayton Traction Company, Cincinnati-Hamilton division, Dayton city division and C. N. & W. division, which showed a grand total of 9,425,230 passengers carried. Freight receipts showed an increase, excepting on the C. N. & W. division.

Foreclosure Decree Signed at Kansas City

Judge Kimbrough Stone at Kansas City, Mo., has signed the decree of foreclosure against the Kansas City Railways. No date has been set for the sale, however, that detail being left to John T. Harding, special master in the receivership, who will conduct the sale.

The decree signed by Judge Stone is a printed document of 173 pages. It contains a description of all of the property owned by the railway and embraces the court's rulings on the priority of the principal claimants. It does not give to the first mortgage bondholders more than the amount of their lien against the property. If the sale price is sufficient to produce more than enough to satisfy the first mortgage holders and pay their interest, the second mortgage bondholders will share, then Mr. Armour's claim will be satisfied, and finally the stockholders will participate. The court will dispense any further proceeds.

Interests dissenting from the decree's provisions have three months in which to appeal from the rulings of Judge Stone.

A new ownership of the railways by Jan. 1, 1926, is not unlikely. As soon as the appeal time has elapsed, the progress in winding up the receivership is expected to be rapid. Perhaps by late summer Mr. Harding will be ready to fix a date for the sale. Thirty days' notice will be required, then the sale will be held and the bids certified to Judge Stone. In the meantime, the court's valuation of the property will have been completed, giving the court accurate information as to what the sale value of the property should be.

Toronto Paid $671,538 Arbitration Costs

The amount of the costs to the city of Toronto, Ont., in connection with the arbitration proceedings under which it purchased the Toronto Railway was $671,538, and in connection with the appeal to the privy council against the award $25,573, a total of $697,111. Among the fees to experts the following payments were made: W. S. Murray, $26,268.99; A. S. Richey, $86,759.12; C. A. King, $36,614.20; C. R. Harte, $9,105.91; W. D. Pence, $4,136.22; T. Scullin, $1,992.10; C. H. Clark, $2,614.44; R. M. Feustal, $2,998.36; C. Remelius, $4,454; W. S. Twining, $615.32; A. T. Spencer, $1,090.00.

RAILWAY STATISTICS OF THE VIRGINIA RAILWAY & POWER COMPANY

	Richmond		Petersburg		Interurban		Norfolk		Portsmouth		Total	
	1924	1923	1924	1923	1924	1923	1924	1923	1924	1923	1924	1923
Revenue passengers	41,715,344	42,402,172	3,357,365	3,880,752	1,767,468	1,975,358	25,018,674	27,479,653	3,721,631	4,409,392	75,580,482	80,147,327
Transfers and free passengers	13,566,972	13,672,124	654,489	716,241	102,862	19,844	4,004,336	4,132,002	519,543	564,781	18,848,202	19,104,992
Total passengers	55,282,316	56,074,296	4,011,854	4,596,993	1,870,330	1,995,202	29,023,010	31,611,655	4,241,174	4,974,173	94,428,684	99,252,319
Percentage of revenue passengers using transfers	31.92	31.56	19.17	18.11	5.4	0.7	14.92	13.92	13.46	12.22	24.22	23.04
Average fare per passenger, including transfers and free	$0.0443	$0.0445	$0.0427	$0.0417	$0.1331	$0.1437	$0.0544	$0.5360	$0.0517	$0.0524	$0 0524	$0.0496
Car-miles	8,883,437	8,648,160	792,570	792,430	828,821	874,318	5,429,982	5,549,964	1,155,559	1,382,590	17,090,369	17,247,462
Car-hours	1,083,750	1,077,413	99,390	100,658	58,519	61,487	596,355	627,279	138,398	173,007	1,976,812	2,039,844
Average passengers per day	151,045	153,628	10,961	12,594	5,110	5,466	79,298	86,607	11,588	13,590	258,002	271,921
Total revenue per car-mile	$0.2781	$0.291	$0.231	$0.2566	$0.3146	$0.3407	$0.2972	$0.3115	$0.1914	$0.1901	$0.2778	$0.2905
Total revenue per car-hour	$2.279	$2.336	$1.842	$2.02	$4.425	$4.844	$2.706	$2.756	$1.599	$1.519	$2,402	$2.456
Operating expenses per car-mile	$0.215	$0.2215	$0.1731	$0.1768	$0.2391	$0.2613	$0.2364	$0.2413	$0.2058	$0.2056	$0.2204	$0.2266
Operating expenses per car-hour	$1.763	$1.778	$1.38	$1.392	$3.362	$3.715	$2.152	$2.135	$1.719	$1.643	$1.906	$1.915

Lake Shore Electric Railway System Reports Smaller Surplus

A surplus of $92,198 was realized by the Lake Shore Electric Railway System, Cleveland, Ohio, in 1924, against $172,461 for the previous year. These figures include operation by two subsidiary railways and two power companies. The accompanying statements give the income results separately of the Lake Shore Electric Railway, the Lorain Street Railroad and the Sandusky, Fremont & Southern Railway as shown in the 24th annual report.

EARNINGS AND OPERATING EXPENSES OF THE LAKE SHORE ELECTRIC RAILWAY

	1924	1923
Gross earnings	$2,211,518	$2,235,662
Operating expenses and taxes	1,779,879	1,709,889
Net earnings	$431,638	$525,772
L. & C., T. F. & N. and 1st cons. interest	205,975	205,975
	$225,663	$319,797
All other interest	132,724	135,024
Surplus	$92,938	$184,773
Ratio of operating expenses to gross earnings, per cent	80.48	76.48
Car-miles	4,198,831	4,055,508
Income per car-mile, cents	52.67	55.12
Operating expenses and taxes per car-mile, cents	42.39	42.16
Net earnings per car-mile cents	10.28	12.96
Passengers carried	6,242,863	6,967,058
Earnings per passenger, cents	20.84	22.03

DETAILED EARNINGS AND EXPENSES OF THE LAKE SHORE ELECTRIC RAILWAY

Earnings	1924	1923
Passenger revenue	$1,290,162	$1,521,282
Mail revenue	3,671	2,876
Express revenue	180,647	316,173
Freight revenue	458,131	151,070
Transportation	187	178
All other revenue	278,719	244,082
Total	$2,211,518	$2,235,662
Expenses and taxes		
Maintenance of way and structures	$259,085	$239,401
Maintenance of equipment	158,895	153,490
Operating power plants	318,265	368,059
Conducting transportation	610,522	542,676
Traffic	15,364	8,765
General and miscellaneous	272,417	253,177
Taxes	145,329	144,318
Total	$1,779,879	$1,709,889

For additions and improvements charged to capital account the Lake Shore Electric Railway expended $145,889 and the Lorain Street Railroad $64,619.

The Lorain Street Railroad rebuilt 3,450 ft. of single track of 80-lb. rail on concrete base in Lorain. At Elyria, 2,450 ft. of single track was rebuilt with 100-lb. rail on concrete base. Five city cars were purchased and placed in service.

The Lake Shore Electric Railway rebuilt with new 100-lb. rail on concrete base 2,200 ft. of double track at Lorain.

On June 28, 1924, a cyclone struck a portion of the cities of Sandusky and Lorain, killing nearly 100 people and causing great destruction of property. At Lorain especially great damage was done, practically all of the trolley poles, trolley wires, high-tension poles and power and transmission lines of the Lake Shore Electric Railway and about one-half of the lines of the Lorain Street Railroad were destroyed. Two cars were overturned in the streets and the freight station unroofed. The loss in earnings and expense of replacement of damaged property cost the companies not less than $125,000.

EARNINGS AND OPERATING EXPENSES OF THE SANDUSKY, FREMONT & SOUTHERN

	1924	1923
Gross earnings	$119,975	$1[illegible],797
Operating expenses and taxes	113,779	108,155
Net earnings	$6,195	$6,641
Interest paid	32,250	32,250
Surplus	*$26,054	*$25,608
Ratio of operating expenses to gross earnings, per cent	94.84	94.21
Car-miles	343,432	235,882
Income per car-mile, cents	34.94	48.67
Operating expenses and taxes per car-mile, cents	33.13	45.86
Net earnings, per car-mile, cents	1.81	2.81
Passengers carried	260,468	293,500
Earnings per passenger, cents	32.35	33.33

*Deficit.

EARNINGS AND OPERATING EXPENSES OF THE LORAIN STREET RAILROAD

	1924	1923
Gross earnings	$286,458	$281,946
Operating expenses and taxes	260,424	263,569
Net earnings	$26,034	$18,377
First mortgage bond interest	27,500	27,500
	*$1,465	*$9,122
Other interest	23,662	24,318
Surplus	*$25,128	*$33,441
Ratio of operating expenses to gross earnings, per cent	90.91	93.48
Car-miles	969,292	935,332
Income per car-mile, cents	29.55	30.14
Operating expenses and taxes per car-mile, cents	26.87	28.18
Net earnings per car-mile, cents	2.68	1.96
Passengers carried	3,773,619	3,676,080
Earnings per passenger, cents	7.59	7.67

*Deficit.

New Richmond Valuation Figure $11,006,987

Allen J. Saville has submitted to the State Corporation Commission of Virginia a valuation report in which he fixes the value of the Richmond property of the Virginia Railway & Power Company at $11,006,987. Mr. Saville includes in his report a table of the percentage of net earnings which would accrue to the company if a 7-cent cash fare were made effective. This is the only fare that he mentions. He does not, however, specifically recommend a 7-cent fare.

In fixing the value of the company's Richmond property at $11,006,987, Mr. Saville has arrived at a valuation much greater than the $7,500,000 fixed for the city in the Beeler report, as of January, 1922, and far below the $16,850,000 claimed by the company as of Jan. 1, 1925.

At the same time it was announced that a separate report has been drawn up by Edwin Wortham, local engineer, for the city, and that this report fixes the present valuation at $7,301,350, which is less than the Beeler valuation. Counsel for the city and company will have an opportunity to reply to the statements in the Saville report before the State Corporation Commission on June 3, it was announced by the commissioners.

These were the principal developments on May 23 in the Virginia Railway & Power situation. General plans for the future development of the company's traction and light properties throughout the state will await the return to this country of Charles A. Stone of Stone & Webster, who have purchased the controlling interest in the company from Frank Jay Gould.

Improvement in Honolulu in 1924

The total revenue from all sources of the Honolulu Rapid Transit Company, Honolulu, Hawaii, for the year 1924 was $1,014,349, compared with $988,928 for the year 1923. The total operating expenses for the year were $713,930, compared with $618,708 for the year 1923. The number of passengers carried was 19,576,438, against 20,317,672 in 1923. The number of transfer passengers increased from 3,873,923 in 1923 to 4,781,791 in 1924. Total passenger revenue for the year was $992,416, compared with $971,131 for 1923. These facts were made part of the manager's report contained in the annual report for the year ended Dec. 31, 1924. Manager Johnson stated that the decrease of full fare passengers carried and the unavoidable delay in securing the increase of fare resulted in a lower gross revenue for the year than was anticipated; the increase in operating expenses as shown below was due to increased maintenance of tracks and equipment, an increase in price of fuel oil, and the increase of wages put into effect in October, 1923.

HONOLULU RAPID TRANSIT COMPANY, LTD.

Operating revenues	1924	1923
Revenue from transportation:		
Passenger revenue	$990,443	$969,810
Bus revenue	11,844	4,461
Special car revenue	1,972	1,319
Freight revenue	932	2,841
Total revenue from transportation	$1,005,193	$978,433
Revenue from other railway operations:		
Rents of buildings	$2,045	$2,410
Miscellaneous	911	704
Interest	6,198	7,380
Total revenue from other railway operations	$9,155	$10,494
Gross revenue from operations	$1,014,348	$988,928
Operating expenses:		
Way and structures	$88,414	$71,561
Equipment	78,568	59,583
Power	94,812	79,481
Conducting transportation	351,110	318,657
Traffic	5,099	3,721
General and miscellaneous	95,924	85,702
Total operating expenses	$713,930	$618,708
	$300,418	$370,219
Replacements chargeable to operating expenses	25,432	34,518
	$274,986	$335,701
Taxes	$128,577	$135,343
Profit and loss	3,261	....
Depreciation	45,089	37,519
	$176,928	$172,862
Net revenue from operations	$98,057	$162,838
Deductions:		
Interest	$1,506	$6,423
Dividends	75,000	190,000
	$76,506	$196,423
Balance 1924 to surplus (deficit 1923)	$21,550	$33,584

The Kalihi Bus service was continued during the year, and with the increase of fare in October, free transfers to and from street cars were provided. This resulted in considerable increase of patronage. It is expected that with the increased patronage the service will show more profitable operation during 1925. The report states that it will be necessary to supplement the bus equipment for the Kalihi district with the addition of either one or two buses of a more improved type to maintain a favorable operating factor. The management is now studying the advisability of providing a cross-town bus service for Kaimuki, connecting with the Waikiki car line.

Replacements chargeable to operating expenses were made in the different departments during the year as follows: Way and structures, $15,628, equipment, $9,059; power, $385, and general and miscellaneous, $361, making a total of $25,433.

The annual report of the Honolulu Rapid Transit Company also contained a statement of the president, Alfred L. Castle. His statement explained the details of the various fare hearings during the year and gave the history of the decision of the commission in fixing a rate base of $3,250,000. He recommends the abolition of the tax to the city and the county of Honolulu, which meant 2½ per cent of the company's gross transportation revenues.

Net Earnings in Havana Decrease

Gross earnings from operation of the electric railway department of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for 1924 were $5,924,606, an increase of 1.0 per cent over 1923. The net earnings were $1,971,734, or a decrease of 7.7 per cent over 1923. According to the report of the president to the stockholders the relatively unfavorable showing of the railway department was due largely to a sympathetic strike which led to a suspension of railway service for substantially a week.

The report of the general manager, included in the report to the stockholders, states that at the end of 1923 the regular schedule covered 37 different lines, requiring 448 cars on weekdays and 445 on Sundays. One new line was added and at the end of 1924 the regular schedule called for 480 cars on weekdays and 475 on Sundays. Passenger traffic was somewhat better than in 1923, when the gain was largely offset by the loss during the strikes in April and November. The increase in operating expenses was due partly to the increase in wages and salaries, and partly to excessive congestion of street traffic which interfered with the operations of the cars.

For the first time since 1917 considerable extensions of the railway line were built, divided between the central districts of the city, where the density of traffic had increased greatly, and new outlying residential districts that are being developed. The total amount of new single track added to the system in 1924 was 8.33 miles and the total length of single track reconstructed was 2.05 miles. Fifty new model passenger cars were built and put in service and four old type cars were reconstructed. The construction of 50 additional new cars was authorized, of which fifteen were begun.

STATISTICS OF OPERATION AT HAVANA

	1923	1924
Total number of passengers carried.......	114,292,880	114,872,616
Passenger car-miles	17,722,683	18,028,046
Passenger earnings	$5,714,644.00	$5,743,630.80
Passenger earnings per car-mile..........	$0.3224	$0.3186
Total earnings from operation...........	$5,864,904.00	$5,924,606.26
Total operating expenses	$3,728,344.94	$3,952,872.56
Total operating expenses per car-mile....	$0.2103	$0.2192
Operating ratio	63.57%	66.72%
Net earnings from operation.............	$2,136,559.06	$1,971,733.70

Sale of South Bend Line Under Foreclosure Ordered

An order for the sale of the Chicago, Lake Shore & South Bend Railway, known as the South Shore lines, has been issued by Judge Thomas W. Slick of the United States District Court at South Bend, Ind. Floyd O. Jellison, South Bend, was named special master in chancery to conduct the sale. The judge approved an order prepared by attorneys for the railroad and the Cleveland Trust Company, trustee for the bondholders.

The plan proposed for the reorganization of the road provides for improving the property and turning the management over to Samuel Insull and associates. After the legal proceedings have been carried to a successful conclusion and a program is finally approved by the Public Service Commission the new company will work out a new plan which will include a change from the present alternating current electrification to direct current. A review of the basis on which the reorganization will be carried out was published in the ELECTRIC RAILWAY JOURNAL for Feb. 7, page 238.

Pass and One-Man Car Subjects Injected Into Baltimore Valuation

The subject of fare structure has been brought into a hearing to determine the valuation of the property of the United Railways & Electric Company, Baltimore. The Maryland Public Service Commission is devoting about three days each week to it. The hearing was resumed on May 19 and on May 21 was resumed until May 27.

When the hearing was resumed Clarence W. Miles, people's counsel, presented a petition to the commission asking that the railway be directed to show cause why it should not put into effect a $1 weekly pass good within the one-fare city-fare zone. It also was asked that the company be required to show cause why the one-man cars should be continued in operation. Furthermore, an intensive investigation into the complete rerouting of the lines was suggested.

Counsel for the railway objected to the petition on the ground that it had no place in the hearing to determine the valuation of the property. After taking the subject under consideration, however, the commission granted the petition in part. This was done after Mr. Miles filed an amended petition in which dates were eliminated. The commission directed that the United show cause why the $1 weekly ticket should not be issued and also that the testimony must be presented before the company concludes the presentation of its direct testimony in the valuation hearing. The company also was directed to show cause why the one-man cars should be continued in operation and to make studies of the rerouting. The subjects of one-man cars and rerouting, however, are not to be considered by the commission during the valuation hearing.

The fare petition took up a large part of the time of the hearing, but Adrian S. Hughes, Jr., said that the power-distributing equipment was in approximately 90 per cent perfect condition. John E. Zimmermann of Day & Zimmermann, contractors, Philadelphia, and Albert S. Richey of the Worcester Polytechnic Institute testified as to the condition of the company's tracks. Two methods were used by Mr. Zimmermann, he testified, one indicating that the tracks are in 81 per cent perfect condition and the other showing them to be in 84 per cent perfect condition. Mr. Richey considered the tracks to be in 85 per cent perfect condition.

Ardor for Municipal Ownership Dampened

The Canadian *Financial Post* says that the predicament of the radial lines running out of Hamilton, Ont., has had the natural effect of damping the ardor of municipal ownership enthusiasists. With these lines operating at a heavy loss, and the city system showing a falling off in receipts, there is not much encouragement either for the company to renew its existing franchise, or for the municipality to take over the responsibility, says this paper. The situation demands very earnest thought. To meet the new conditions there must be a readjustment.

The same authority says that the Hamilton Street Railway has not done well. Recently it was pointed out that the franchise would expire in 1927. Competition from the automobile, coupled with a generally depressed condition of business, made inroads on the traffic of the company, with the result that car earnings fell off materially.

Philadelphia Seeks Tax Refund

Efforts again will be made by the city to obtain from the federal government the refund of $5,000,000 paid by the Philadelphia Rapid Transit Company, Philadelphia, Pa., in income taxes since 1917. Senator Pepper, Mayor Kendrick, City Solicitor Gaffney and W. W. Atterbury, vice-president of the Pennsylvania Railroad, will make a personal appeal to Secretary Mellon of the Treasury to overrule the decision by the Internal Revenue Bureau against the refund.

Last November the federal government refused to refund to the company $5,000,000 of income and excess profits taxes which both the company and the city believe were erroneously paid. The first appeal was made by the company itself. Later the city joined in the action. The grounds set up were that a section of the former federal revenue act exempted from taxation any public utility in which a municipality or other political subdivision had an interest, such as the city had in the Philadelphia railway system by reason of the agreement of 1907.

Final Offer from City for Rainier Valley Line

One million two hundred thousand dollars is the highest figure the City Council of Seattle, Wash., is willing to authorize for the purchase of the Seattle & Rainier Valley Railway. This is $125,000 less than the amount John C. Higgins, attorney for the bondholders, had advised the Council his clients would consider. The attorney's minimum figure. $1,325,000, was based on an assertion that this amount would be required to bring in all the outstanding bonds held by the Rainier Valley bondholders.

Accountants employed by the city say that the price of $1,200,000 is still too high. Isaac Comeaux, city accountant, says $955,000 would be sufficient to take up the outstanding bonds at their actual worth. He said the Rainier company recently sold $400,000 of bonds at 75 cents on the dollar. At this figure the bonds of the company would be worth $879,000 instead of $1,172,000. He said the fact that the city was negotiating for the purchase of the line would tend to raise the quotation for the bonds, but that instead of paying this increase the city, as the only purchaser in the market for the line, should buy the bonds at the value established for them by the recent sale of the $400,000 issue.

Another important finding was that the Rainier Valley citizens will expect the city to pave between the tracks if it purchases the line, an improvement the private company has long been financially unable to carry out. This will cost $500,000 to $750,000, and will add to the interest burden without increasing revenues.

Under the proposal of the city payment for the line will be made in 5 per cent twenty-year utility bonds payable in fifteen installments beginning the sixth year after issuance.

The city is influenced by a desire to obtain use of the Rainier line along Fourth Avenue from Stewart Street to the depot as part of the present municipal system to help relieve congestion on First, Second, Third and Fourth Avenues. If the present municipal line were operated on Fourth Avenue on a rental basis with tracks in the hands of the private company as owner it would cost the city from $30,000 to $50,000 a year in rentals.

The company has 60 days in which to advise the Council whether it will accept the offer. Further, it has been advised that the offer is final with the Council.

Saltair Railway Included in Sale

What is left of the famous Saltair resort, 15 miles west of Salt Lake City, almost totally destroyed by fire on April 22, has been offered to the city of Salt Lake by President Heber J. Grant of the Mormon Church. The offer includes the Salt Lake, Garfield & Western Railway, which operates between the city and the resort. If the city accepts the gift it will assume the bonds now outstanding for the electrification of the railroad. These bonds, in the amount of $267,000, mature serially until 1941. The church now holds a mortgage given by the amusement company, which has been operating the resort, but it is announced that this mortgage will be canceled by the holders in case the city accepts the offer. Should the city take over the property it would be with the idea of rebuilding the superstructure which was destroyed by the recent fire. It is estimated that a modern structure could be built for about $250,000.

The Mormon Church had already been offered $75,000 for the property, but this was rejected. No decision has been made as yet by the City Commission as to what action will be taken.

Bondholders Set Agreeable Price.—Mayor Kendrick of Philadelphia, Pa., recently submitted by message a communication concerning the Frankford Tacony & Holmesburg Street Railway reporting the result of a meeting of the bondholders on May 13. They agreed that if the bid for the system equaled $350,000 the bondholders would be amply protected and satisfied. The city is asked to buy in the line at the receivers' sale in June. As indicated previously in the ELECTRIC RAILWAY JOURNAL it is proposed to link it up with the Frankford "L" to reach the Tacony and Holmesburg sections, after the city spends about $450,000 in new equipment. The ordinance to acquire the line is pending in the committee on transportation and public utilities.

Seek Abandonment of Line.— The stockholders of the Binghamton Railway, Binghamton, N. Y., recently voted to request the Public Service Commission for permission to abandon a portion of the former line in Johnson City. A bus line now serves the major portion of this territory. Operation of the trolley was abandoned with the construction of the Ackley Avenue pavement.

Valuations Reduced. — Valuation of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., which in 1924 stood at more than $8,000,000, was cut to $5,224,870 this year, and the $7,548,291 valuation of the Union Traction Company last year was reduced to $4,719,686 this year by the Indiana Tax Board on May 23.

Operating Income Increases. — The Pacific Gas & Electric Company, operating in Sacramento, Cal., reports to the Railroad Commission its 1924 railway operating revenue as $747,005 compared with $783,977 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $636,927 and for 1923 as $718,794, leaving net operating revenue of $110,078 for 1924 and $65,183 for 1923. During 1924 taxes charged to operation were $47,849 and for 1923 $50,130. Deducting the taxes leaves operating income of $62,229 for 1924 and $15,053 for 1923.

Gross Income Falls Off.—The Central California Traction Company, operating from Sacramento to Stockton in California, has reported its 1924 operating revenue as $592,798, compared with $615,856 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $507,744 and for 1923 as $495,367, leaving a net operating revenue of $85,053 for 1924 and $120,489 for 1923. During 1924 taxes charged to operation were $31,911 and for 1923 $33,920. Duducting the taxes leaves operating income of $33,142 for 1924 and $86,569 for 1923. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus of $73,969 for 1924 and $102,803 for 1923.

Denver Tramway Creditors to Get Stock.—According to an order issued by Federal Judge Robert E. Lewis, creditors of the Denver Tramway, Denver, Col., who file their claims with Ernest Stenger, receiver, before June 1 will be paid with preferred stock if the claims are filed, but claims unfiled on June 1 will be forever barred. It is estimated that $150,000 will cover the amount of the claims.

Net Income Lower.—For the ten-month period ended April 30, 1925, the Brooklyn City Railroad, Brooklyn, N. Y., had a passenger revenue of $9,415,702, against $9,743,958 for the ten-month period ended April 30, 1924. Operating expenses and taxes increased from $7,983,570 in the 1924 period to $8,124,053 for a similar period ended April of this year. After the consideration of income deductions the net corporate income for the ten-month period ended April 30 of the present year was $1,216,666, against $1,662,086 for the ten-month period ended April 30, 1924.

Abandonment Issue Deferred. — A hearing was held by the Public Service Commission on May 26 on the petition of the Kingston Consolidated Railroad, Kingston, N. Y., for consent to abandon the part of its route known as the Colonial line, except for that part running to Kingston Point. After certain proof had been submitted by the company an adjournment was taken to June 5 at Albany. On behalf of the company it was contended that the Colonial line was operating at a large loss and that it constituted a severe drain on the resources of the company. It was claimed that the increases in fare allowed in the last few years had failed of their purpose in that they had not brought about the expected revenues. The company stated that it had an application pending before the Common Council to operate a bus line to serve the territory now served by the Colonial line and a large additional part of the city.

$220,355 Available for Charages.—The San Diego Electric Railway, San Diego, reports to the California Railroad Commission its 1924 operating revenue as $1,482,831 compared with $1,374,908 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $1,220,041 and for 1923 as $1,146,433, leaving net operating revenue of $262,790 for 1924 and $228,474 for 1923. During 1924 taxes charged to operation were $100,492, and for 1923 $98,393. Deducting the taxes leaves operating income of $162,297 for 1924 and $130,080 for 1923. Adding to the operating income, the non-operating income of the company results in a gross corporate income of $220,355 for 1924 and $167,223 for 1923. This represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus.

Personal Items

Messrs. Vaughan and Morley Owner-Managers

Sidney L. Vaughan and William K. Morley are two men sold on the idea that despite the inroads of buses and the growth of the use of the private automobile there is a good future for the interurban railroad intensively developed. What is more significant, they are prepared to back that faith with their dollars and so have just taken over the Grand Rapids, Grand Haven & Muskegon Railway, of which Mr. Vaughan has for some time been vice-president and general manager and of which Mr. Morley formerly was president. Mr. Vaughan will continue with the company in the capacity in which he has served for some time, but Mr. Morley returns to the property as president.

These two men have set for themselves a difficult task, but they are well qualified by training and previous experience to grapple with the problem. Not all the terms under which they took over the road have been made public, but this much is known: a $1,500,000 first mortgage bond issue matures on July 1, 1926. Left entirely to themselves in the handling of the road, the new owners expect by intensive merchandising methods so to re-establish the credit of the company that this obligation can be met.

It does not detract from the part that Mr. Morley will play as president of the road to say that it will be largely up to Mr. Vaughan. He has been actively in charge in the past and will continue as the directing head of the company. Mr. Vaughan is a so-called old-timer. By that is meant he started in at the telegraph key back in the "old days." But Mr. Vaughan knows that old-time railroading is nothing like present-day railroading. He has thought a lot about the matter, and now he is backing his judgment with his money and the money of his associates. He has long known what he would like to do. Now he is free to do it. To his new task as owner-manager Mr. Vaughan brings a wealth of transportation experience.

He learned telegraphy while working as baggage man and tie inspector for the Chicago & West Michigan Railroad, and learned it, he says, during his leisure hours. Not only this knowledge of telegraphy, but his tenacity and ability put him in the successive positions of telegraph operator at Fremont, agent at Holton, agent at Fremont and commercial agent of the Barry Line Steamers at Grand Rapids. All this happened between 1884 and 1902. After opening a city office for the company, he was promoted in 1903 to general freight and passenger agent of the company with offices in Chicago. There he remained until 1906, when he joined the Grand Rapids, Grand Haven & Muskegon Railway as general accountant. In the following year he was appointed traffic manager to look after the increasing passenger and freight business. In February, 1922, he was elected vice-president, and in June, 1922, were heaped upon him the added responsibilities attached to the post of general manager.

W. W. Holden Railway Chairman Southwestern Body

W. W. Holden, superintendent of the traction department of the San Antonio Public Service Company, was elected to the chairmanship of the railway section of the Southwestern Public Service Association at its convention held in Houston, Tex., May 5-8. In thus moving forward another step, Mr. Holden is following out successfully a career conceived at a surprisingly early age. Long before attending college he had decided that the coming electrification of steam railroads would make electric railway work a desirable field of endeavor, and consequently he shaped his education in this direction. He was graduated from the University of Texas after having completed the work of both electrical and civil engineering courses in four years.

W. W. Holden

During an apprentice period with the Westinghouse Electric & Manufacturing Company he made every effort to continue his training for electric railway work. At the end of that time he became electrical engineer and assistant superintendent in the construction of the interurban line from Dallas to Waco and Corsicana. Upon the completion of this construction work, in January, 1914, he entered the employ of the San Antonio Public Service Company, at that time the San Antonio Traction Company. Here he served as a motorman for a three months' training period. He was sent on an extended trip of inspection to look over the practices of various other properties, and upon returning assumed charge of the transportation department in San Antonio.

Mr. Holden was made a captain of engineers during the World War and served with the Sixth Engineers of the Third Division during the war and the occupation of Germany. He returned to San Antonio in May, 1919, and resumed his position as superintendent of transportation. Later he was placed in charge of equipment as well, with the title of superintendent of transportation and equipment. At the beginning of the present year he also took over the supervision of track, becoming general superintendent of the traction department.

Mr. Holden has been a consistent advocate of the use of the bus as an auxiliary de luxe at a rate of fare higher than that charged by the railway. His experience in handling this new transportation vehicle covers a period of more than two years. His conduct of the affairs of the railway in San Antonio has also been marked by the development of engineers in each department trained to administer the routine affairs of daily operation and to take over research work.

Fred E. Henderson, through a reorganization of departments of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., assumed the title and duties of purchasing agent of the company on May 1. Besides being in charge of all the supplies he will also superintend the warehouses, stores and equipment as well as the personnel of these departments. He will continue to act as superintendent of railways, taking over the duties of purchasing agent in addition to his work as head of the railway department. Mr. Henderson has been with the company since 1904, when he was made storekeeper. He was later promoted to general storekeeper, and on the resignation of John C. Cutler was made purchasing agent for the company. He relinquished those duties when the health of the late Otto F. Koss, superintendent of railways, failed and B. C. Adams, then vice-president and general manager, promoted him to succeed Mr. Koss.

W. C. Lancaster was recently appointed chief engineer of the New York Transit Commission. He succeeds the late John H. Madden. Mr. Lancaster is a consulting engineer with offices in New York City. He recently was in the employ of the Board of Estimate as electrical engineer in charge of the design for electrification and equipment of the proposed Staten Island tunnel.

William H. Lines, construction engineer for the Portland Electric Power Company, Portland, Ore., has been appointed assistant to Franklin T. Griffith, president of the company, effective May 15. Mr. Lines joined the organization in 1912 and remained for five years, at which time he resigned to enter private business. In 1923 he returned to the Portland Electric Power Company and has remained in the capacity of construction engineer.

Frank D. True, Portland, Me., vice-president of the Cumberland County Power & Light Company, Portland, Me., and a director of the Androscoggin & Kennebec Railway, was recently elected a director of the Boston & Maine Railroad to succeed Judge Norman L. Bassett, Augusta, Me.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Recognized Types of Paving Brick Reduced

From 66 to four recognized types and sizes of vitrified paving brick is the simplification record of the paving brick industry in the short period of four years, according to announcement just made by the permanent committee on simplification of varieties and standdards of vitrified paving brick of the United States Department of Commerce. At the meeting of the committee, held March 20, at Washington, D. C., one of the five remaining types and sizes of brick was eliminated, thus cutting down the officially recognized list to four in number.

The recognized types and sizes follow:

	Depth		Width (As usually laid)		Length
Plain wire-cut brick (Vertical Fiber Lugless)	3	x	4	x	8½
	3½	x	4	x	8½
Wire-cut brick (Dunn)	4	x	3½	x	8½
Repressed lug brick..	4	x	3½	x	8½

The variety eliminated by the committee after a thorough study of the shipments for the entire industry for the year 1924 was the 3-in.x3½-in.x8½-in. (Dunn) wire cut-lug brick. This particular variety had shown a consistent decline until it represented only 2 per cent of the total shipments in 1924.

Of the total 1924 shipments, 82.1 per cent were in the four types and sizes now recognized by the committee. The most marked growth of any special variety outside of the recognized list was that of the 2½-in.x4-in.x8½-in. vertical fiber (plain wire cut) brick. This size and type of brick increased from 2.2 per cent of total shipments in 1922 to 4.4 per cent of shipments in 1924. Reports from manufacturers indicated a decided trend toward a thinner brick for paving streets and highways of light or medium traffic.

Record Trade Year for the United States

American export trade, which has been steadily increasing since 1921, continued its upward course in 1924 with a gain of 10.2 per cent over the previous year. Last year the value of exports was $4,591,000,000. This is a figure even higher than that for 1921, a year in which the post-war values still influenced foreign trade figures. The increase over 1923 was $423,000,000.

It is shown that in 1923 the value of exports was only 10 per cent greater than that of imports, but in 1924 exports outdistanced imports by 27 per cent, the favorable balance of trade in 1924 being $980,000,000, or more than 2½ times the 1923 balance. With an excess of imports of gold and silver of $222,000,000, our visible favorable balance of trade, which includes both merchandise and gold and silver, was $758,000,000.

Seven countries—Great Britain, Canada, Germany, France, Japan, Cuba, and Italy—purchased nearly two-thirds of American exports in 1924, nearly $3,000,000,000 worth, according to an analysis of the world trade of the United States published by the Foreign Commerce Department of the Chamber of Commerce of the United States. These seven countries in recent years have invariably been found among the country's ten leading customers, with the single exception of Germany from 1915 through 1919. In 1924 35 countries each purchased more than $10,000,000 worth of American merchandise —96 per cent of all shipped abroad—the 80-odd markets in the rest of the world taking only 4 per cent of America's total exports.

A few import records also were made in 1924. A greater amount of standard newsprint paper, 2,714,000,000 lb., at the highest value, $101,000,000, was imported in 1924 than in any other year. The quantity was about 4 per cent greater and the value 3 per cent higher than the previous record imports of 1923.

Exhibit Space at A.E.R.A. to Be Assigned in July

Requests for space at the exhibit to be held in connection with the American Electric Railway Association convention in Atlantic City in October must be filed by June 30. Initial space assignments will be made early in July. Application forms for space are now being sent out. Whether or not intending exhibitors receive applications, it is suggested that they communicate promptly with the Association. Elsewhere in this issue F. C. J. Dell, director of exhibits of the association, explains the arrangements at greater length.

Rolling Stock

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., is remodeling two interurban cars, at South Bend, for use on the Goshen-South Bend division. The remodeling includes the removing of the present type of seats and the installation of chairs, the laying of a heavy carpet on the floor and the removing of the wood partition between the baggage compartment and the rest of the car and putting in glass so that a clear view of the track ahead may be had by passengers. A dome-lighting system will be used with individual lights at each seat. The exterior of the car will be painted orange, with black trimmings and crimson or dark red under the window sash. The cash and ticket register will be removed, and the stove installed in the rear of the car. When completed, which will be in three weeks, the cars will be put in operation between South Bend and Goshen.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, recently purchased two additional Mack buses of the city type with seating capacity for 29.

Trade Notes

S. F. Fannon, industrial engineer with Sherman Service, Inc., New York, is planning to expand the scope of his industrial work by giving talks on worker co-operation to employees. The purpose of these talks will be to explain to employees the problems of their employers. A pamphlet, lately published by Sherman Service, describes the scope of these talks. For several years Mr. Fannon has been a popular speaker on industrial co-operation at meetings of various business organizations and associations. He delivered an address "A New Conception of the Job" at the meeting of the New England Street Railway Club on Dec. 4, 1924.

Beckwith-Chandler Company, Newark, N. J., has appointed J. Alex Wilson sales manager. Mr. Wilson was formerly in charge of the pyroxylin development of the company, which manufactures paints and varnishes.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 25 on electric flashing beacons and electric traffic signals.

Walter A. Zelnicker Supply Company, St. Louis, Mo., dealers in rails and equipment, has issued bulletins Nos. 332, 333 and 334, describing contractors' equipment.

General Electric Company, Schenectady, N. Y., has recently issued a résumé of the uses and value of automatic arc welding, together with a description of the welding apparatus and generating equipment used, in a bulletin bearing the number 48937.1 and entitled "Automatic Arc Welding." It is a 20-page, paper-bound booklet.

Rome Wire Company, Rome, N. Y., has completed its magnet wire handbook containing a complete set of tables and information concerning magnet wire, especially adapted for engineering use.

Metal, Coal and Material Prices

Metals—New York	May 26, 1925
Copper, electrolytic, cents per lb..........	13.612
Copper wire base, cents per lb.............	15 875
Lead, cents per lb.......................	8 35
Zinc, cents per lb.......................	7.47
Tin, Straits, cents per lb.................	56 25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons....................	$4.25
Somerset mine run, Boston, net tons......	1.975
Pittsburgh mine run, Pittsburgh, net tons	1 95
Franklin, Ill., screenings, Chicago, net tons	2 175
Central, Ill., screenings, Chicago, net tons	1 875
Kansas screenings, Kansas City, net tons	2 625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft..................................	$6 25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2 20
Linseed oil (5-lb. lots), N. Y., per gal.....	$1 09
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots..............	0 1575
Turpentine (bbl. lots), N. Y., per gal......	$1 07

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, June 6, 1925 *Number* 23

Wasted Government a National Menace

GOVERNMENT activities have increased greatly in the past few years. The tendency toward the injection of government in business which became general during the war has not been checked up to the present time. The able presentation of the forms of waste in government which was made by Secretary Hoover at the recent meeting of the United States Chamber of Commerce and which was abstracted in the issue of ELECTRIC RAILWAY JOURNAL for May 23, page 820, shows how far the federal government alone has gone afield in finding new activities in which to expand its efforts. Bureaus and commissions have been formed for this and that object, and the functions of existing agencies have been expanded so that all sorts of activities foreign to the original purposes of government have become a matter of course. The exposition of the subject by Mr. Hoover covered only the federal government. Every state, every city and many of the counties have likewise expanded their functions so that they too have had a similar drift from the narrow line of governmental activity.

It is high time that the swing of the pendulum be reversed. That this will be a difficult thing to bring about was indicated clearly by Mr. Hoover. It will take the combined efforts of all responsible elements in every community working together for the common cause to produce tangible results. Here is one of the great functions of the chamber in which it can be of immense value to business in general. There is no body which is so well equipped to handle a problem of this kind and no group of men so representative of the rank and file of American business as is this one. No one element in the fabric of the country will get more good out of the discussion and any results that may come from it than will the electric railways. They have been badgered by politicians, restricted in their methods of operation and financing and almost strangled with respect to fares, largely by the injection of these extraneous elements into the original function of government. For this reason every management should welcome the opportunity offered to work toward the end of a restriction of these extra governmental functions.

Spartanburg Votes to Retain Its Street Cars

JUST what is the philosophy of the people of Spartanburg, S. C., who recently refused by a two to one vote to allow the local utilities company to amend its original franchise by elimination of the clause which required the operation of street cars within the city limits? The ordinance drafted by the City Council provided that the South Carolina Gas & Electric Company be relieved of the necessity of operating street cars on condition that it remove its tracks and bear the expense of restoring the street paving. In addition the traction company was to have provided a bus transportation system.

The street car tracks have been practically in disuse for two years with the exception of one railway line. Buses have been in operation and have been giving a fairly dependable service. To all outward appearances it looked as if the bus had saved the situation and that the new management with its proposals for bus extensions had solved a problem which dates back to December, 1922, when the company abandoned several lines on the ground that they were unprofitable. Following the abandonment were discussion, disagreement and seemingly endless litigation in which the City Council, the Railroad Commission and the Supreme Court took prominent parts. Finally, in the fall of last year a new management took over the task of supplying 25,000 people with transportation service in which the bus was the principal vehicle. The controversy was over and a new era seemed to be dawning. But with the opportunity given by the City Council to the people to decide on street cars or buses because of the necessary rehabilitation program, the street car, almost a relic of the past as regards that city, came into its own again.

The reason for this attitude is not entirely obvious. Probably the public was not opposed to the new régime nor antagonistic to the methods employed. But when the issue meant tearing up the tracks the people saw the extinction of what had been an important factor in the growth of their city and they refused to sign its death warrant. They forgot the tribulations of the past few years caused by the non-functioning of these same vehicles and only remembered their pristine usefulness.

Less Unsprung Weight a Development of Importance

UNSPRUNG weight of electric railway equipment is a factor of major importance in track life and maintenance. This was emphasized by R. H. Findley of Omaha in a paper before the Mid-West Electric Railway Association, abstracted elsewhere in this issue. Unquestionably the time has arrived for careful consideration of this subject. Not only from the standpoint of track construction and maintenance costs is it important. Only when the present excessive unsprung weights which are carried on the rail are materially lowered will the problem of noise reduction be solved.

Much progress has been made already in the reduction of the total weight of electric railway equipment, and further strides in this direction may be expected. Both on city and interurban cars the universal use of lighter equipment will undoubtedly permit substantial savings both in first cost and maintenance of track. But by supporting on springs a large part of the weight which at present delivers direct hammer blows to the rail the possible savings would be materially greater than any which could reasonably be expected by mere reduction in total weight of equipment.

Furthermore it is hard to conceive of really noiseless car operation in city streets without the general use of much more flexible roadbeds than have been possible heretofore. To build track of that type, however, which will stand up reasonably under traffic it is imperative that a much larger part of the total car weight be supported on springs.

Methods by which this development will be accomplished are hard to foresee. Some thought has been given to the possibility of taking the car motors off the axles and driving through some arrangement of bevel or worm gearing, perhaps along the lines of automotive practice. When the present axle suspension and spur gear drive were adopted the design and manufacture of gearing were crude. Automotive requirements have been responsible for a remarkable improvement. The present type of railway motor drive is so simple and reliable that there is a natural reluctance to consider seriously any complication which might increase cost. However, the demand for improvement is now becoming so insistent that some form of drive to take the unsprung weight off the car axles may be expected to attract increasing attention.

Cushioning for wheels presents another possibility. This may in itself help reduce the hammer blows on the rail. Some interesting experiments in this direction are being made. From both standpoints—track cost and noise reduction—lessening of unsprung weight demands attention from manufacturers.

Mayor Hylan's Own Board Pricks Five-Cent Fare Bubble

MAYOR HYLAN'S hand-picked Board of Transportation in a report made on May 28 buried his 5-cent fare issue under a weight of evidence heavy enough to inter permanently any seeker for office on the Mayor's policies except the Mayor himself. It may be that this time he is finished, too, but no one seems to be sure about it, though every paper in New York except the Hearst sheets expresses that hope. Certainly if figures could bury a man those contained in the report just made public bury the Mayor face down.

The system on which the Mayor has set his heart would have a length of 57 route-miles, providing single-track mileage of 170 miles, not including sidings. Without any equivocation the Mayor's board says that the continuance of the 5-cent fare depends absolutely upon the method of financing. Financing entirely with 50-year bonds would necessitate an 8-cent fare plan, whether the system be operated by the city or by a corporation.

These are plain words, but they are the words of the board itself. Moreover, the board says that on a capital outlay of $542,915,000 under the 5-cent fare plan the capital could be obtained only by putting on the users not more than 40 per cent of the original cost. This would be taken care of by the issue of 50-year bonds, the interest and sinking fund of which would be paid out of earnings. Of the remaining 60 per cent of the original investment, 35 per cent would be contributed by the city at large and would be raised by the sale of short-term serial bonds retired in annual installments during the next eight years. The report declares that this can be done without any increase in the tax rate. Finally, 25 per cent would be paid by the owners of property directly benefited by the improvement. In short, the board outlines a financial policy that, if adopted, will preserve a uniform 5-cent rate of fare by distributing the cost of the new rapid transit facilities "equitably upon the beneficiaries thereof."

It is all very cute, but the beneficiaries show signs of rebelling. The 5-cent fare may appeal to them in the abstract, but the prospects of a yearly visit from the tax gatherer in addition to the one he now makes does not appeal to them. Their spokesmen are up in arms. Moreover, there is grave doubt as to whether such assessments could be made so equitably as to be constitutional.

Electric Power Securities a Favorite Form of Investment

THE good market at present for the stock and other junior securities of electric power companies has incited some of the financial papers to publish striking comparisons of the prices for these securities in 1921 and at present. The figures show a very large rise in many cases, but this fact alone is no proof that the increase is unjustified. While some of the stock may seem high on the basis of present earnings, that of other companies is undoubtedly low, according to the same standard.

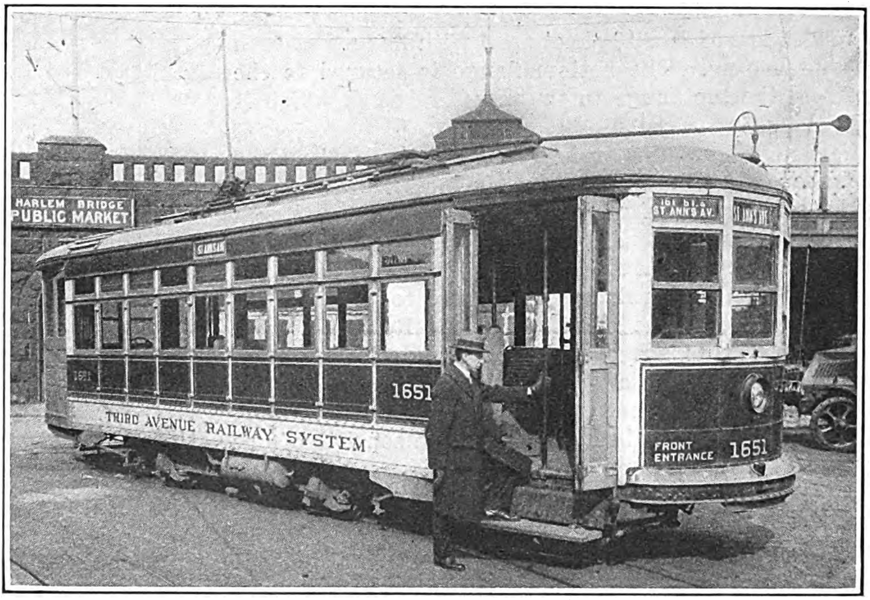
It is not surprising that at the present time there should be a demand for electrical stock. This country is in an electrical age. The uses of electrical power have been tremendously stimulated during the last ten years by the rise in wages during the same period. It is not only in the factory that appliances by which one person can do the work of two or three are being used. These improvements are sought also in the business office, on the farm and in the home. In each place the demand is due to the high cost of manual labor. Added to this, of course, is the higher scale of living at present and the greater purchasing power of the American people. Both of these reasons have stimulated the demand for more illumination and for all kinds of electrical appliances which add to the comfort of living.

Another factor in the increased demand for electric power securities is the growing recognition by the public and by courts of the necessity of fair rates for public servants. Still other factors are the engineering improvements and financial consolidations which have enabled these companies to serve an ever-increasing number of customers. During the war expansion to take care of this demand was difficult. Since 1918 the return to normal conditions in this respect has brought about a large expansion in utility enterprises.

The electric railway man naturally is interested in the effect of this situation on electric railway development. As a part of the electrical industry, electric railways must share to some extent in this growing popularity for electrical securities. One reason, of course, is that a great many of the electric railways also do a power business. Another is that much of the pioneer work in securing adjudication on franchise and rate questions will be undertaken by the power companies and its value will inure to the electric railways. Still another reason is that the engineering improvements stimulated by this expansion of the electric power industry should tend to reduce the cost of energy to railway companies which purchase power.

25,300-Lb. Single-Truck Car Seats 46

One-Man Car Built for Third Avenue Railway Has Many Distinctive Features, Including Long Wheelbase Truck, Removable Side Panels and Outside Brake Rigging —Simplified Framing Is a Major Factor in the Reduction of Weight



This Light-Weight Car of the Third Avenue Railway, New York City, Has a Low Step and Flush Platforms. The Side Panels Are Removable

HIGH seating capacity combined with light weight are features of a new single-truck one-man car that recently has been built for the Third Avenue Railway, New York City. This car is of the full convertible type with removable side panels that has been used successfully for some years by this company. Seating 46 passengers, it has a length over all of 35 ft. 2½ in. and a truck wheelbase of 9 ft. 6 in. Completely equipped its weight is 25,300 lb. Other features of interest are the outside brake rigging and the flush platform design.

Included in the car order, which was awarded to the J. G. Brill Company, Philadelphia, were 49 convertible motor cars with bodies 30 ft. 4½ in. long and a single convertible car body, which is the one described, 35 ft. 2½ in. long. The construction of the latter was the same except for the extended length.

All the car bodies were of a convertible type, the side opening being arranged so that the panels can be taken out in summer and screens substituted. The round-end vestibules have folding doors and steps at diagonal right-hand corners of the car body. The roof is of the plain arch type. An interesting feature of the longer car is the remodeling of a Brill 79-E truck so as to give a 9-ft. 6-in. wheelbase. Rolled steel wheels of 24 in. diameter are used. The weight of this car is 25,300 lb. and the seating capacity 46. This gives a weight per seat of 550 lb., which is from 75 lb. to 250 lb. less than many recent cars ordered for city service.

FRAMING SUBSTANTIAL BUT LIGHT

The underframing is of steel throughout. Side sills consist of 3-in. by 3-in. by 3/16-in. rolled-steel angles running continuously between the end sills. The latter, which are 4 in., 5.4-lb. steel channels, extend the full width of the car between the side sill angles to which they are securely riveted. Steel channels of the same weight are used for crossings, but they have a 2-in. by 1½-in. wood furring on the sides. Where double crossings are used at the end of elliptic springs, there is a 1-in. by 2-in. wood furring. One crossing is located directly in the center of the car body and one either side of the center, a distance of 2 ft. 11 in. from the back of the crossing. Two 4-in. rolled-steel channels are placed back to back and spaced 1 in. apart at 6 ft. 3⅞ in. from the center of the car to the center of the two crossings. This eliminates the crossings and angle wheel piece stringers used in other cars now operated by the railway.

The outside platform knees are of 7-in. 9.8-lb. channels, and diagonal braces extend from the fender to the end sill. These are of 3-in. by 3-in. by 3/16-in. rolled-steel angles. Diagonal tie straps are of 2-in. by ¼-in. bars. Bumpers consist of 4-in. rolled-steel channels with their flanges turned outwardly. A section of 3-in. channel is riveted directly under the bumpers at the center, so as to form an anti-climber. A casting is installed back of this channel to receive the railway's standard drop pin.

The corner posts are of 3-in. by 3-in. by 3/16-in. rolled-steel angles, and side posts are steel tees 3 in. x 1½ in. by ¼ in. These extend in one continuous piece between side-sill angles forming carlines. They are riveted at both ends. The side posts are equipped with malleable-iron brackets for fastening the removable side panels or side screens, depending on whether the car is open or inclosed.

The top window support consists of a 1½-in. by 1½-in. by 3/16-in. rolled-steel tee riveted outside the posts and extending the full length of the body. The belt is a 2-in. by ⅜-in. flat steel bar. Letter-panel angles are ¾ in by ¾ in. by ⅛ in. The letter panels extend 18 in. above the upper sash. The removable side panels are straight. The two end side panels consist of No. 16 blue annealed sheet steel and are not removable. The side sheathing is of ⅛-in. blue annealed steel.

The ends of the car are inclosed with round-end vestibules having three windows. These have a 5/16-in. agasote lining bent to radius. Vestibule center posts and belt rail are of ash. The corner posts are 2-in. by 2-in. by ⅛-in. rolled steel angles with an ash filler. Vestibule windows have bottom sash stationary and the upper arranged to drop. The upper sash are fitted with a rack and lock the same as the side sash in the car body, so that they may be held at various heights. All sash are of ash glazed with double thickness glass and fitted with sash lifts. The left-hand side of the vestibule is inclosed with two fixed panels.

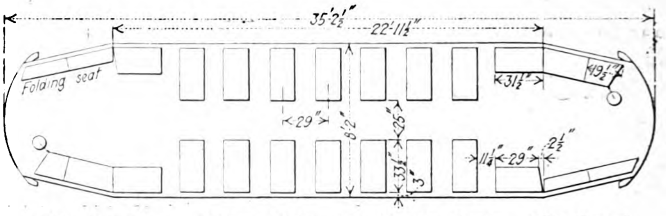
CONTINUOUS POSTS SUPPORT ARCH-TYPE ROOF

The roof is of the plain arch type and is continuous for the full length of the car body. It is made of ⅜-in. agasote with wooden hoods. A covering of No. 8 canvas bedded in white lead is used. The roof is supported by the side post tees which form the carlines. The sides are of No. 16 sheet steel with flanges at both top and bottom. The bottom flange is secured to the roof and the top flange to the monitor board, which is ¾ in. thick.

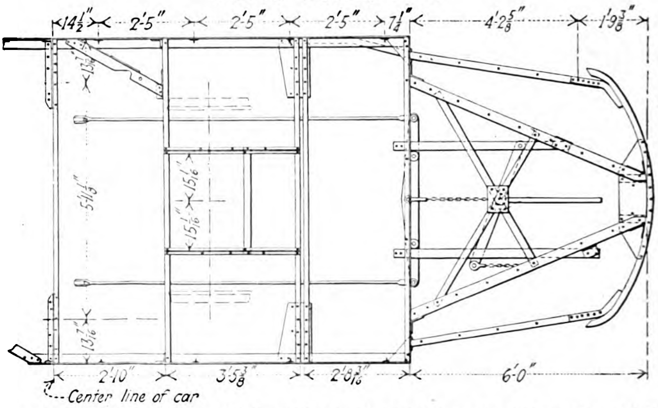
A 1⅛-in. yellow pine trolley board is installed on the roof above the ¾-in. monitor board, to receive two trolley bases. The monitor board serves as the top for a ventilating duct extending the full length. The duct sides are No. 16 sheet steel flanged at both top and bottom. The bottom flange is fastened to the roof and the top flange to the monitor board. Roof mats and motormen's steps are provided at diagonal corners of the car. Bulkheads are omitted, but the continuous bulkhead angle at either end is 3 in. by 3 in. by 5/16 in.

The flooring in the body and platform consists of one layer of ¾-in. yellow pine tongued and grooved. This is laid lengthwise in the body and crosswise on the platform. Floor strips are laid lengthwise in the aisle and crosswise between transverse seats. The aisle floor mat strips are of tapered maple ⅝ in. wide at the bottom and ¾ in. high. The floor strips between seats are ½ in. high. The inside finish, including all doors, sash and molding, is of ash. The ceilings have carline finish. Advertising card racks are provided on each side of the body.

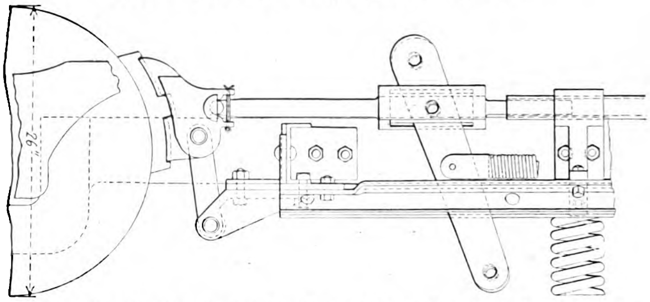
The lower portions of the removable side panels are of 5/16-in. agasote, while the upper portions are double thickness glass, the two being set into wooden frames. The long car has seven of these removable panels and two permanent end panels of similar design. The short car has two less removable panels. The screens which are installed in place of the side panels during the summer months are of diamond mesh wire. These are arranged to be applied with the same brackets as the side panels. The upper sash, which remain in the car, are fitted with sash fixtures and are arranged to raise. The company's standard sash lock is used on the side sash. Sash racks are pressed steel with notches.



The Car Has a 25-In. Aisle with 33½-In. Seats. The Total Seating Capacity Is 46



Body Underframing Was Lightened by Strengthening the Main Members and Omitting Unnecessary Parts



Truck Brake Rigging Was Installed on Outside of Trucks to Provide Space in Center for Installation of Electrical Equipment

The 46-seat car has seven Brill Winner transverse seats with reversible backs on each side. The shorter cars, which seat 38, have but five cross seats. The seats have pressed-steel pedestals and the seat backs are provided with polished bronze grab handles arranged diagonally on the backs. All seats and backs are made of ash, wooden slat construction. The transverse seat panels and backs are made as light as is consistent with strength. Clips are installed on the bottom of transverse seats to prevent them from being raised from position when the passenger rises.

There is a longitudinal seat for two persons at each corner of the interior and on the diagonal left-hand corners of the platform. The seats on the platform extend to the dasher. A folding slat seat on each platform in front of the door opening is arranged to fold up against the car body.

The motorman's seat at each end of the car is similar to the Brill swing type, but is made much lighter. Corrugations at the bottom of the stancheon permit the

EQUIPMENT FOR FULL CONVERTIBLE CAR OF THIRD AVENUE RAILWAY

Builder of car body	J. G. Brill Co.
Type of car	Full convertible
Seating capacity	46
Weight, total	25,300 lb.
Length over all	35 ft. 2½ in.
Truck wheelbase	9 ft. 6 in.
Width over all	8 ft. 2 in.
Body	All steel
Interior trim	Ash
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse (foot control)
Armature bearings	Bronze
Axles	3⅞ in.
Bumpers	Channels, flange outside
Car signal system	Consolidated
Car trimmings	Brill
Control	K-11
Curtain fixtures	Curtain Supply Co., Ring 88
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Wheelguards	Providence (all metal)
Gears and pinions	Westinghouse gear, Cincinnati pinion
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Dayton 8 in.
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	G. E. aluminum
Motors	Two GE-247, inside hung
Paint	Chas. Moser & Co.
Registers	International Type R
Sanders	Brill Dumpit
Sash fixtures	Edwards
Seats	Brill Winner
Seating material	Ash slats
Springs	Brill
Step treads	Kass safety
Trolley catchers	Earll No. 7
Trolley base	Nuttall Type 11, Form A
Trolley wheels	G.E., Form A-40
Trucks	Brill 70-E-2
Ventilators	Consolidated honeycomb
Wheels	26 in., solid steel

seat brackets to be rotated and then held in any desired position. This provides for a changeable distance between the dasher and center of the motorman's seat.

Each side window has a pantasote curtain mounted on Rex all-metal curtain rollers. A bathtub type motorman's curtain of khaki duck is placed on each platform. This is supported on a pipe hanger. A wooden box arranged on the frieze board at the left-hand corner of the vestibule holds the curtain when it is not in use.

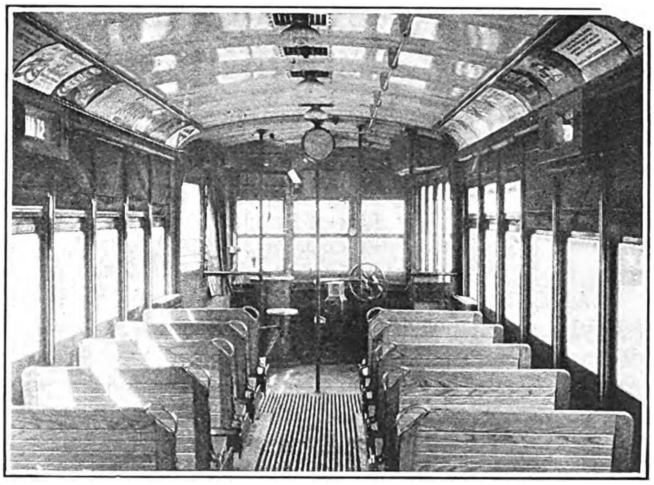
Double two-part folding doors are provided at diagonal right-hand corners of the car. One part is arranged to fold out against the body corner post, and the other to fold out against the vestibule corner posts, giving a clear opening of 4 ft. Doors are of ash, glazed in the upper portion with double thickness glass, while the lower portion is provided with agasote panels. The single folding step is the full width of the door opening. This is of 1¼-in. oak and is arranged to operate in conjunction with the folding doors by a National Pneumatic engine, located in the heading above. Each step is fitted with a 3-in. Kass safety tread.

There is a stanchion in the center and another at the right of each door opening. Additional stanchions with horizontal legs are placed at the right-hand side of the bulkhead and the left-hand side of the platform, and one with a railing reaching from the center of the bulkhead to the door opening separates incoming and outgoing passengers. All stanchions are 1-in. diameter pipe with malleable-iron fittings, enameled black. A chain with catch between the two stanchions at the center of the door opening slides into the stanchion when not in use. A drop bar is located at each doorway to slide on a vertical stanchion of the railway company's standard.

SPECIAL TRUCKS WERE DESIGNED

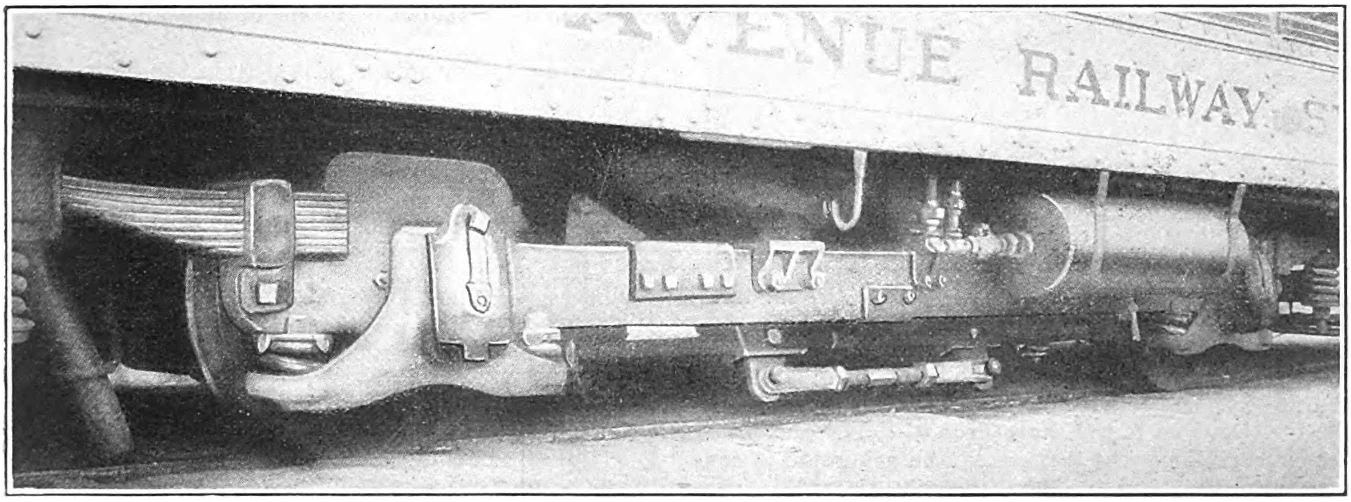
The truck construction for the longer car is of particular interest. The short car bodies are mounted on Brill No. 79-E1 trucks with 8-ft. wheelbase. For the long car this was remodeled so as to provide a 9-ft. 6-in. wheelbase with 24-in. wheels. The brake rigging is placed at the outside of the truck. This gives a space underneath for equipment approximately 4 ft. square. This simplifies the inspection of equipment. The springs of the longer truck are of heavier construction than those used with the short car bodies.

The type of equipment, dimensions and weight are given in an accompanying table. The passenger signal system consists of a Consolidated Car Heating Company's buzzer located on the underside of the hood at each end of the car, with a push button on each corner post. Exhaust type ventilators are used with grilles. Five of these are arranged to take light fixtures. Six Hunter destination and route signs are used on each car. One is located over each right-hand vestibule window, one over each center vestibule window, and one over each center side sash. The two signs in each end of the car are arranged for curtains 19 in. wide and the side signs for 25-in. curtains. The side sign boxes are illuminated from the car body lights and have a removable frame on the back in place of a hinged lid. By removing the frame, the curtain and mechanism can be entirely removed from the sign boxes.



Lamps Are Installed on the Ventilators and the Wiring Is in the Ventilating Duct Above the Roof

Each car is provided with two Brill "Dumpit" lever-operated sand boxes complete with sand hose. The sand boxes are of galvanized iron and are located under seats at diagonal corners of the car. The lever for operating the sanders is close to the controller, so as to permit the installation of a stationary seat on the left-hand side. The electrical equipment consists of two GE-247 motors, inside hung. K-11 controllers are used, together with pedal type control interconnected with the air brakes. An alarm gong on the roof above each platform is arranged to be operated from the motorman's position by means of a hand cord.



The Truck with 9-Ft. 6-In. Wheelbase Is Arranged with the Brake Rigging Outside to Give Clearance for Equipment Beneath

Special Overhead During Grade Elimination

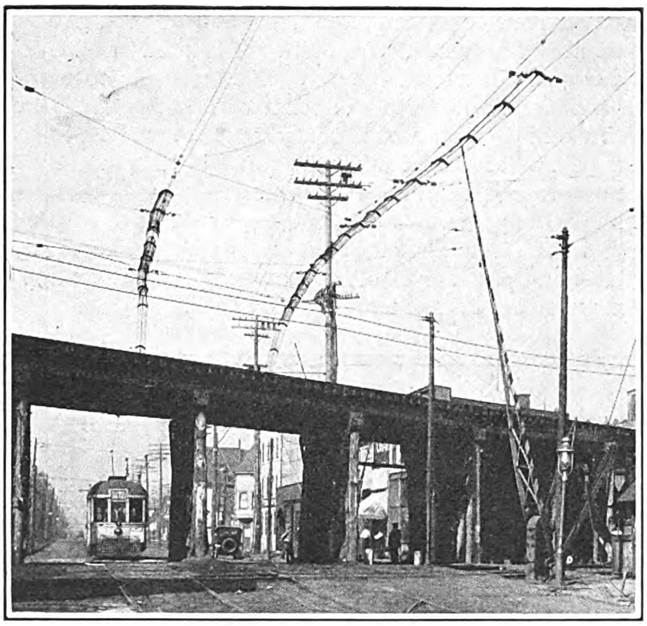
A Drop in the Trolley Wire from 22 Ft. to 15 Ft. Was Necessary on One of the Cleveland Railway Company's Lines in a Space of 6 Ft.

By James Scott
Superintendent of Overhead Construction Cleveland Railway, Cleveland, Ohio

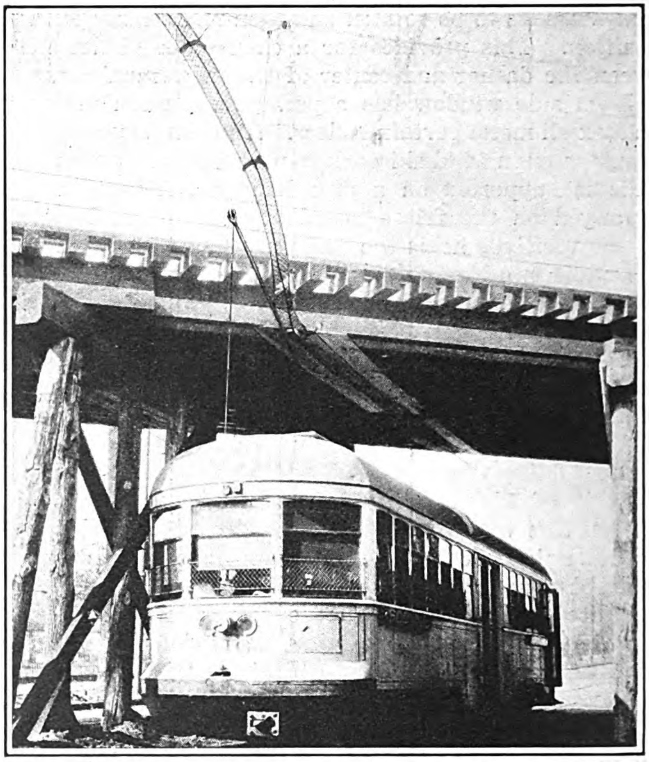
GRADE-CROSSING elimination work of the Pennsylvania Railroad confronted the Cleveland Railway with an unusual problem during the past year. There were three of these crossings eliminated on the trolley lines at Woodland, Qunicy and Central Avenues. The surface railroad lines at these points originally consisted of four tracks, but during the reconstruction all steam traffic was operated over two tracks, while a trestle was constructed over the other two. The construction of trestles, the elevating of switches and spurs extended over a period of more than ten months. During this time, special overhead construction was necessary on the electric lines, which were kept in continual operation.

The method of reconstruction used made it necessary for the railway to maintain the trolley wire and guard at a height of 22 ft. over the two tracks which were in use for steam road traffic and then to drop to a height of about 15 ft. in order to pass under the trestle. This was particularly difficult as the trestle was but 6 ft. west of the steam line tracks. The construction used is shown in the accompanying illustrations.

One of the most difficult problems that had to be solved was to provide for the action of the trolley wheel and pole while a car passed under the construction in the direction from the steam road track toward the trestle. Due to the sharp drop of the overhead and the close proximity of the trestle, the pole came in contact with the bridge before the wheel started down the incline of the trolley wire. It was, of course, most desirable to have such a construction that the wheel would not leave the wire and also so that it would not be necessary to stop the car while the conductor pulled the trolley pole down.



Type of Overhead Construction While Temporary Trestle Was Being Used for Grade Elimination



The Trolley Pole of Electric Cars Passing Underneath the Trestle Made Contact with a Bronze Pan, and the Trolley Wheel Was Directed Back Onto the Wire by a V Construction

Careful consideration of the problem showed that while it was not possible to prevent the trolley wheel from leaving the wire, it was possible to arrange a construction so that the wheel would be automatically replaced on the wire and at the same time keep the circuit from being broken. A bronze bridge approach pan was placed on the trestle so as to extend a few inches beyond the edge of the trough. This provided clearance for the trolley wire and pole. As the pan had a beveled edge, a roller effect was given when the pole made contact. The bridge pan was V-shaped with sides 1½ in. deep and an opening at the apex where the switch approach led onto the trolley wire. The wire was supported through the trough by means of barn hangers and was led through a groove on the top of the pan and then out by means of an ordinary switch approach.

When the trolley wheels passed from the high to the low section of the wire they followed the wire until the pole made contact with the pan. The wheels were then forced away from the wire as the car proceeded and operating current was fed through the bronze pan to the pole. As the car proceeded the pole slid along the pan until the wheel came in contact and was then directed through the V onto the trolley wire. This provided a continuous circuit for current collection and no trouble from dewirement was experienced.

Root Lifeguard Used at Grand Rapids

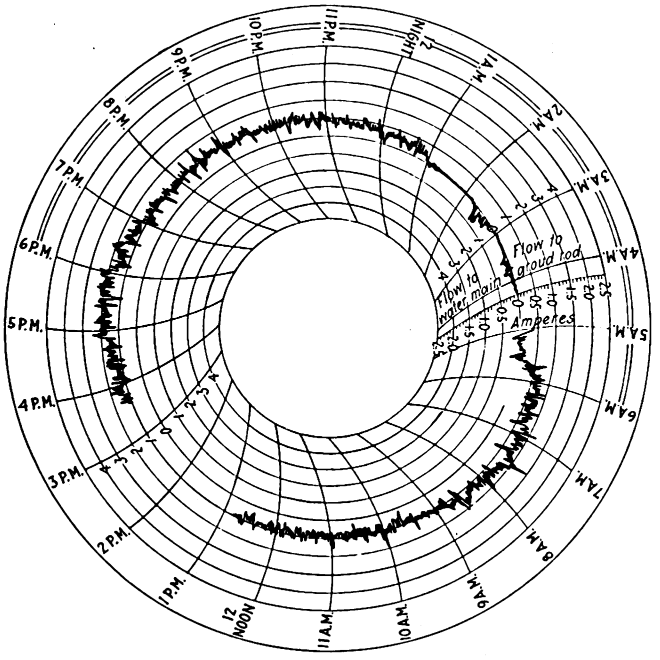
IN THE specifications of the Grand Rapids car built by the St. Louis Car Company, published in ELECTRIC RAILWAY JOURNAL for May 23, page 808, the lifeguards were incorrectly listed as being H. B. type. This should have been the Root all-spring steel lifeguard.

Stray Earth Currents Increased by Salt

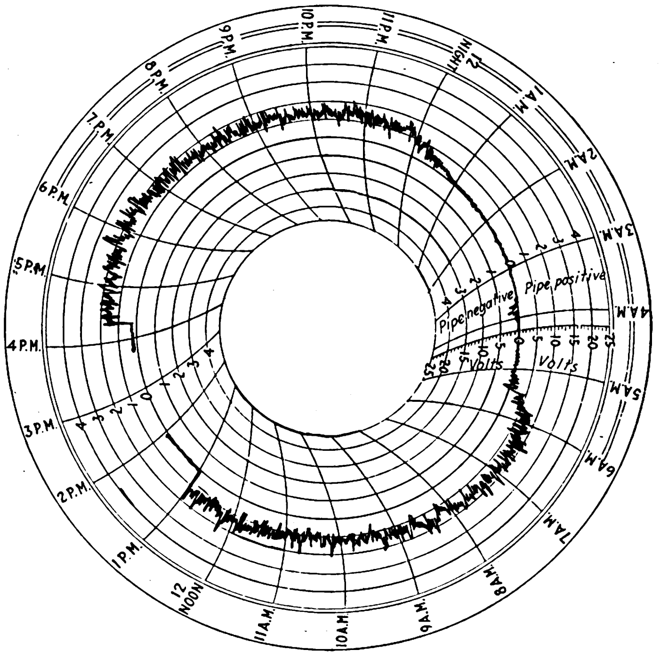
Use of Common Salt at an Electric Railway Junction to Prevent Freezing of Track Switches so Lowered the Resistance of the Soil in the Vicinity as to Cause the Rapid Destruction of Adjacent Water and Gas Pipes by Stray Currents

By Charles F. Meyerherm
President and Engineer Albert F. Ganz, Inc., New York City

PREVENTION of freezing of track switches by the use of common salt is a practice of many electric railways. The salt is sprinkled on the rails and about them, usually when there is snow or ice on the ground. As the snow melts the salt goes into solution and permeates the earth in the vicinity. Tests made by the author show that the salt does not reach out at once, but there is a marked tendency to lower the resistance of the leakage path for electrolytic currents through the earth.



Record Showing Current Flowing from Water Main to Temporary Ground Rod



Voltmeter Record Showing Potential of Water Main Referred to Earth

Electrolysis conditions in the vicinity of a certain interurban electric railway junction had been under observation for a number of years owing to the frequent failures of water and gas pipes. A total of thirty failures of the water service pipes supplying two adjacent buildings had occurred in twelve years' time. The gas service pipes supplying the same buildings had also been destroyed frequently, and in addition a section of a 6-in. extra heavy cast-iron branch water main crossing under the tracks in this neighborhood had failed three times due to corrosion.

The junction referred to is situated about ½ mile south of a substation which feeds this section of the interurban line. An 8-in. cast-iron water main and a 4-in. cast-iron gas main parallel the rails between the junction and the substation. Tests indicated that at the junction these pipes were at a potential some 9 volts positive to the rails and about 7 volts positive to earth. The pipes were also positive to rails throughout the entire distance between the substation and the junction. Measurements of current on the 8-in. water main indicated a loss of about 20 amp. from the water pipes in the vicinity of the junction.

While the positive potentials of pipes with respect to earth were thus very high for a considerable distance, no failures of pipes had occurred except in the neighborhood of the junction. The circumstance at once led to a suspicion that some peculiar local condition might be the chief factor. It was known that salt had been used on the track switches over a long period of years to prevent freezing. The illustration is a reproduction of a photograph taken in April, 1923, of one of these track switches. The white deposit noticeable on the ground between the rails is a crust of salt crystals remaining from the previous winter's use. That this salt should have withstood the spring thaw and rains shows the extent to which salt had been used at this switch. It was suspected that this salt had gradually seeped into the earth beneath, thus lowering the electrical resistance of the soil and hastening the corrosion of the water main, and that the successive excavations had caused further penetration.

Laboratory tests were therefore made on four samples of the soil, with results as shown in the table:

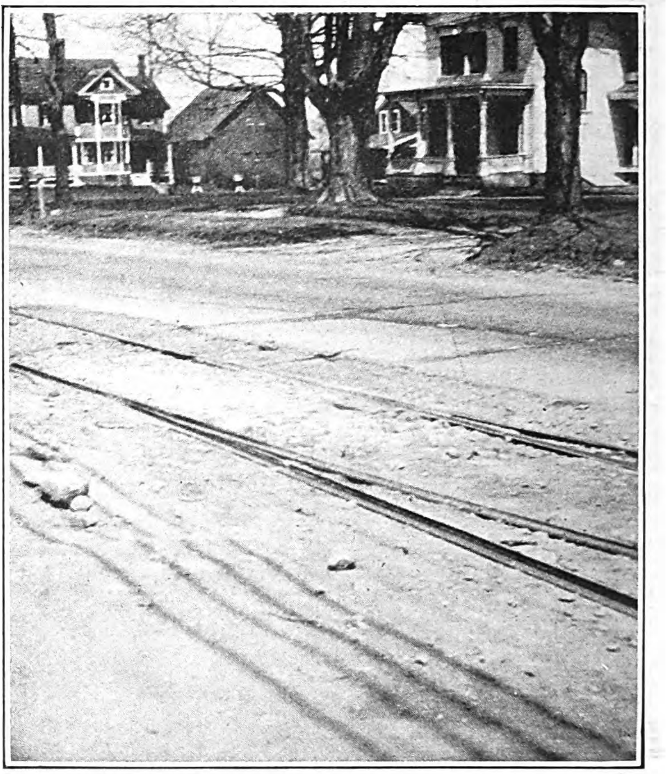
VARIATION IN EARTH RESISTANCE WITH CONTENT OF SODIUM CHLORIDE

Sample No.	Per Cent of Sodium Chloride in Dried Sample	Resistivity Ohms per Centimeter-Cube
1	0.0092	21,500
2	0.0023	15,900
3	0.066	710
4	0.300	166

Sample No. 1 was taken from the trolley roadbed at a point some distance from track switches; sample No. 2 was taken from a field close to the track near the substation, while samples Nos. 3 and 4 were taken from the trolley roadbed near the switches in the locality where the pipe corrosion had occurred. The chemical analyses of the four samples showed them to be quite similar in general constituents except that those samples taken from under the track switches contained a very much larger proportion of sodium chloride than the samples taken at points remote from track switches. The table shows that each of the two samples containing the higher proportions of sodium chloride had a very much lower resistivity than the two samples containing the lower amounts.

To show that the low resistivity of samples Nos. 3 and 4 was caused by their comparatively large content of sodium chloride the following laboratory experiment was performed. Sufficient salt (NaCl) was added to two specimens of sample No. 1 to bring their respective sodium chloride contents up to those found in samples Nos. 3 and 4. Resistivity measurements were then made on these specimens. It was found that the addition of the salt had reduced the resistivity from 21,500 ohms per centimeter cube to 1,045 ohms per centimeter cube in one case and to 265 ohms per centimeter cube in the other. These values of resistivity agree closely enough with the values given in the table for samples Nos. 3 and 4 to be considered a satisfactory laboratory check. They indicate clearly that the salt had been the cause of the low soil resistivity encountered near the junction.

The electrolysis effects of the low-resistance earth near the junction were investigated with the McCollum earth-current meter.* The results of tests made with this instrument on a 6-in. cast-iron branch water main crossing under a track switch have been sketched in Fig. 1. It will be observed in this figure that directly under the east trolley rail (test hole No. 1) the resistivity of the soil had the comparatively low value of 660 ohms per centimeter cube. The rate of current discharge from the pipe to earth at this point was excessively high, averaging 578 milliamperes per square foot of pipe surface. About 7 ft. west of the east rail (test hole No. 2) the soil resistivity had increased to 900 ohms per centimeter cube, while the discharge rate, although still very high, had fallen off to 192 milliamperes per square foot of pipe surface. Ten feet west of the east trolley rail (test hole No. 3) the soil resistivity again increased, while the discharge rate became still lower. At a point about 30 ft. west of the east trolley rail (not shown in the figure) the soil resistivity reached the comparatively high value of 60,500 ohms per centimeter cube and the rate of current discharge from the pipe became negligible.



A Crust of Salt Crystals Remaining from the Previous Winter's Use

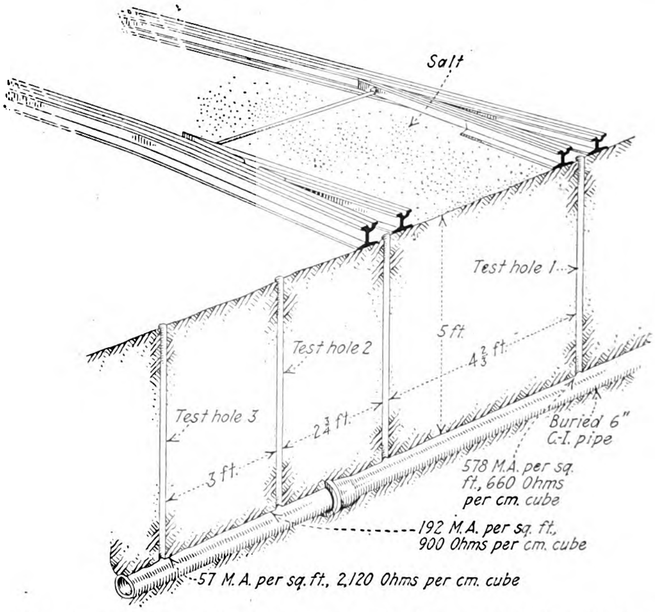

Salt
Test hole 1
5 ft.
4⅔ ft.
Test hole 2
Test hole 3
2¾ ft.
3 ft.
Buried 6" C-I. pipe
578 M.A. per sq. ft., 660 Ohms per cm. cube
192 M.A. per sq. ft., 900 Ohms per cm. cube
57 M.A. per sq. ft., 2,120 Ohms per cm. cube

Fig. 1—Earth Samples Taken from Various Test Holes Showed Increasing Resistance as Distance from the Switch Increased

The foregoing measurements show clearly to what extent the soil close to the switches has been affected by the salt, since the resistivity increased rapidly with the distance away from the rails. The rates of current discharge also fell away rapidly with increase of this distance. At the last point tested the surface of the ground is several feet higher in elevation than the tracks and the soil had not been disturbed for making pipe replacements, so that the possibility of salt from the switches penetrating to the pipe was slight. The rates of current discharge found under this switch were unusually high and easily account for the severe corrosion which had occurred there. Data collected by the Bureau of Standards show that material electrolytic corrosion has been found where the current discharge rate is 3 or 4 milliamperes or higher per square foot of pipe surface.

The unusually low resistance of the soil near this switch was strikingly illustrated by the following occurrence: It was found that by connecting a small copper wire between the water main and a piece of ¾-in. iron pipe driven about 2 ft. into the earth near the trolley rails a fluctuating current reaching peaks of over an ampere flowed from the pipe to the ground rod. Twenty-four-hour records of the current delivered over this connection and also of the potential difference between the water main and this ground rod are shown reproduced in Fig. 2. The large magnitude of this current is unusual and was made possible only by the very low resistance of the earth at this point, since the contact area of the ground rod was comparatively small (0.5 sq.ft.). If driven into the normally high-resistance earth common to this region, a potential difference of 7 or 8 volts between this ground rod and earth would cause a current flow of only a few milliamperes.

---

*The McCollum earth-current meter was described in detail in the ELECTRIC RAILWAY JOURNAL for Nov. 5, 1921.

Measurements of soil resistivity and current discharge were also made along the water mains at other points in the positive pipe-to-rail potential area. The results of the resistivity tests are shown in the graphic chart. The curve shows the general prevalence of relatively high-resistance soil except in the vicinity of the track switches, where it has been reduced by the salt.

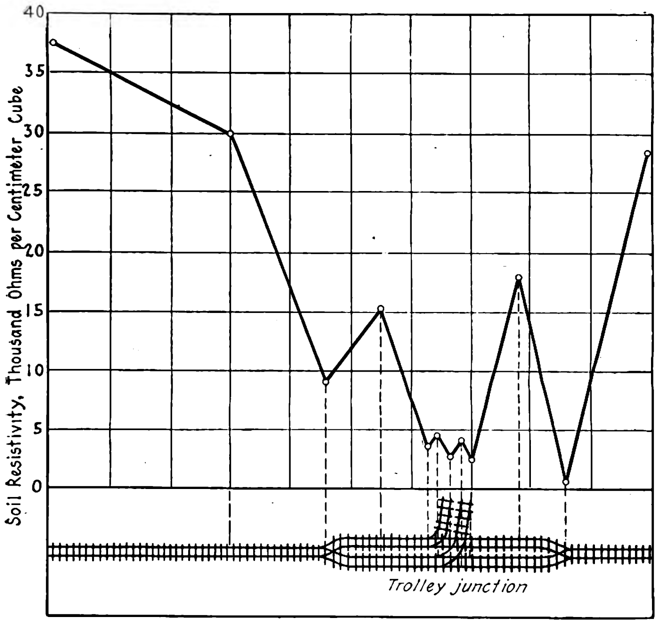


Fig. 2—Soil Resistivity in Relation to the Switch Location

The two water service pipes mentioned previously, which had so frequently required replacement, branch from the main water supply line opposite the junction and extend across the street under the switches. The earth in the ditch containing the service pipes had been kept wet by the leaking pipes and loose by the frequent excavations for repairs. The wet loose earth had allowed salt from the switch to make its way along the ditch as far as the water main, and water from the ditch making its way along the main itself carried the salt with it for some distance on either side of the service taps. It was found that near these taps the soil immediately surrounding the main had a resistivity of only about one-quarter of the value found 3 ft. above the main. The pipe at these points was discharging current to earth at average rates of from 4.6 to 67.5 milliamperes per square foot of pipe surface. Physical examination showed this section of the main to be so badly corroded that it required relaying 215 ft. of pipe.

Earth-current meter tests on the water pipes at locations where there were no switches in the track, and therefore where no salt had been used, showed a uniformly high soil resistance and only a slight discharge of current from water pipes to earth. Very little corrosion was found on the pipes at these points.

The positive potentials of the water pipes with respect to trolley rails in the section under discussion, with the present conditions of railway load and power distribution, are maintained at comparatively high values chiefly by the predominance of high-resistance earth. As a result, service pipes or branch mains which closely approach or cross under the trolley tracks in the narrow sections of low-resistance soil near the track switches are subjected to extremely destructive rates of current discharge to earth.

It is obvious that in this particular case the practice of using salt to prevent freezing of track switches has brought about a troublesome electrolysis problem in a region where, under normal conditions, there would be little tendency for electrolysis trouble to develop. The frequent and costly interruptions to water, gas and trolley service in the past, and the possibility of their recurrence in the future, would certainly justify the development by the railway of some other method than the use of salt for keeping track switches clear of ice and snow.

USE OF SALT SHOULD BE RESTRICTED

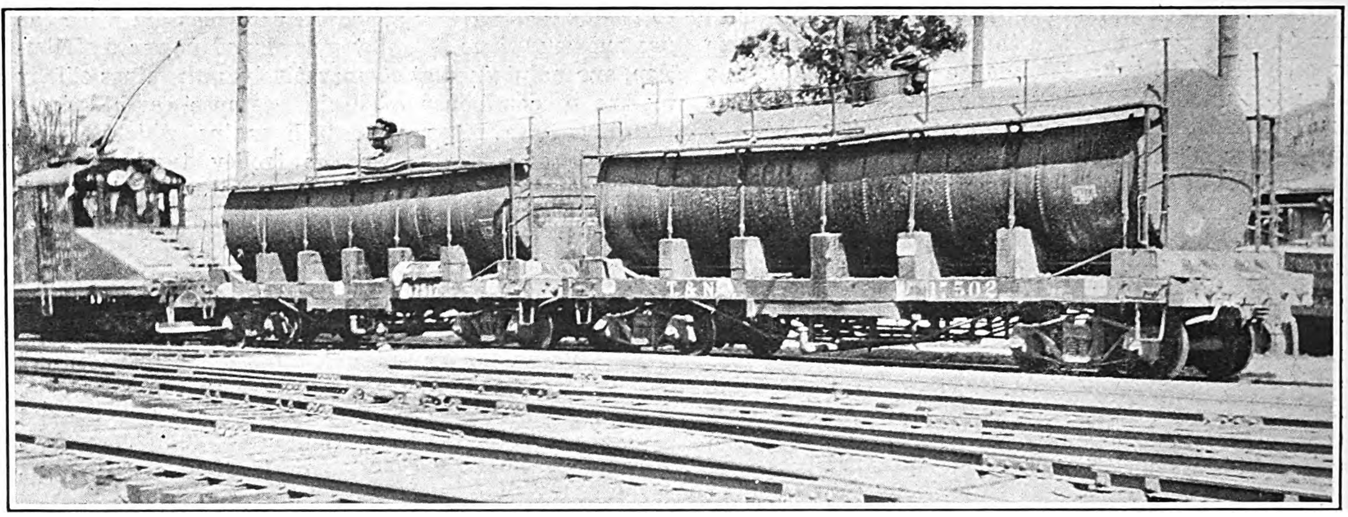
It should be pointed out that soil of high electrical resistance is one of the few natural hindrances to stray currents, and the owners of underground metallic structures should at least be able to count upon the measure of protection which this natural condition affords. For this reason the careless use of salt at track switches and special work, or any similar practice which tends to break down the soil resistance, unnecessarily increases the electrolysis hazard. The most directly harmful effects of the use of salt on the tracks are felt in the areas where the buried metallic structures are positive in potential to the rails. Objectionable effects are also present in the negative potential areas where the narrow belts of low resistance earth produced by the salt may deliver large amounts of railway current to the subsurface structures. This current may leave the structures for earth and augment corrosion in the positive areas. As in the case under discussion, conditions in a given locality may thus become aggravated to the point where the electrolysis problem is brought to a head, where otherwise the damage might have progressed at so slow a rate that the situation would not require summary attention.

These considerations seem to indicate that the use of salt at track switches and special work should be under careful supervision. Instead of being left in the hands of irresponsible track laborers, as is generally the case at present, it should be used under the direction of a responsible railway engineer, so that the quantity used, if any, could be kept at the practical minimum, and that suitable provision could be made and maintained for draining off surface water from the roadbed adjoining switches.

Capital Line Insures Employees

CO-OPERATIVE group insurance, including sickness and accident benefits as well as ordinary life insurance, has been established by the Washington, Baltimore & Annapolis Electric Railroad for its employees. This is underwritten by the Metropolitan Life Insurance Company and affects some 350 employees of the railway. Premiums are paid jointly by the workers and the company.

The total coverage amounts to about $530,000 life



Weed-Killing Tank-Car Equipment Used by the Pacific Electric Railway

insurance and the same for accidental death and dismemberment insurance. Each employee subscribing to the plan receives $1,000 life insurance and a similar amount of accidental death and dismemberment protection. Health and accident insurance provides a benefit of $10 a week for a maximum of 26 consecutive weeks.

Supplementing the usual insurance provisions of the policy, which include a total and permanent disabiilty clause, are certain service advantages, such as a free visiting nurse service and a department for the distribution of booklets and other literature on health subjects and sanitation.

Killing Weeds with Poison

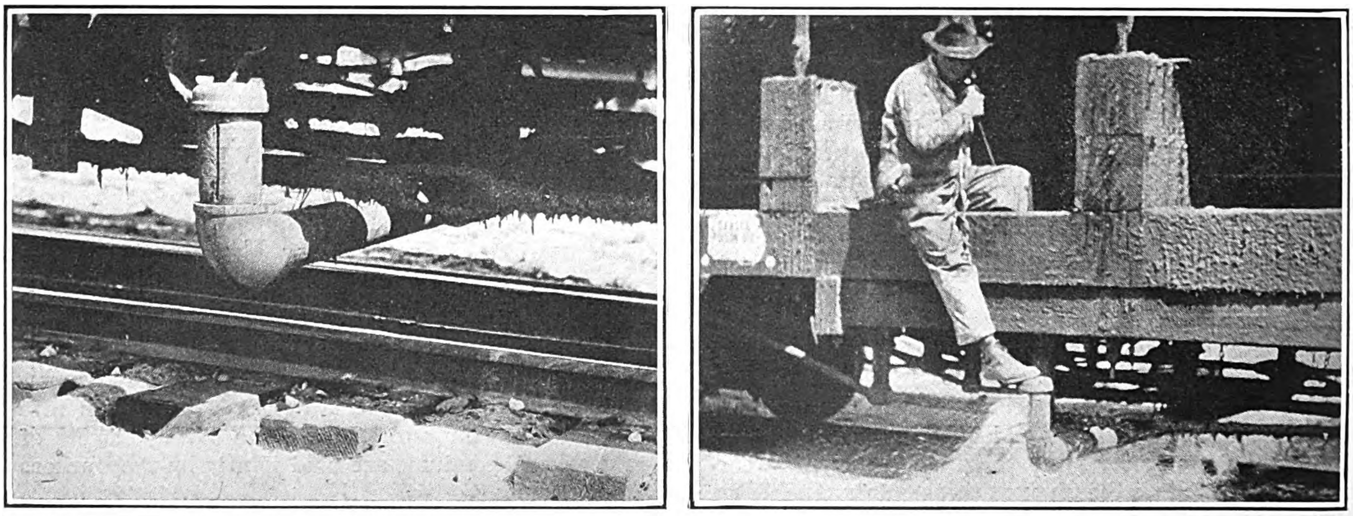
Application of Arsenite on Pacific Electric Railway Has Prevented Their Growth Along More than 1,000 Miles of Track

WEEDS as well as flowers flourish in the southern part of California, and one of the problems of the Pacific Electric Railway is to keep the tracks clear of such growths. Sodium arsenite, used extensively during 1923 and 1924, has been proved an efficient weed killer and is now being applied each season over 74 per cent of the 1,115 miles of track operated by the company. The magnitude of this phase of the company's operations is indicated by the expected expenditure of $51,000 for the purpose in 1925. More than 90 per cent of this sum will be for the poison and its haulage from the plant of the United States Smelting, Refining & Mining Company at Salt Lake City, Utah.

Four 12,000-gal. tank cars and one work motor car are used. A 4-in. quick-acting valve is connected to the bottom of the tank car, piping from which extends to each side, as shown in an accompanying illustration, being connected to an elbow, an 8-in. length of pipe and a cap. The elbow and piping are slotted ¼ in. for the release of the poison. The valve is controlled by rope connection. From 10 to 12 ft. of ground is sprayed beyond each rail, the apparatus covering a total width of about 30 ft. The unit travels at 15 m.p.h.

Sodium arsenite is shipped in concentrated solution form. To treat 800 miles of single track 80,000 gal. is mixed with 200,000 cu.ft. of water. The dilution is made immediately prior to use, the agitation caused by the movement of the train being sufficient to insure adequate mixing and to prevent segregation. The car is first filled with the required amount of water and the concentrated poison in another car is added by means of a 2-in. centrifugal pump, operated by a 5-hp. motor.

Despite the heavy initial expense the use of arsenite has proved economical. Weed growth is being reduced year by year, and the fire hazard has been eliminated. Application of the poison has been found to be more effective when the soil is damp.



At Left—A ¼-In. Slot Is Made in the Vertical Pipe and Elbow to Spray the Poison. At Right—The Poison Sprayer in Action siderable public expense, whereas under present conditions these streets answer for all practical purposes.

A factor of great importance in the street railway situation in Colorado Springs is the tremendous growth in the use of the private automobile. The number has increased from 1,098 in 1914 to 9,576 in 1924. There is now one for every 4.22 inhabitants or more than one automobile for every family in the city. Nevertheless, until the last fare change was made the railway had retained practically 90 per cent of its traffic after ten years of this competition. Automobile registration figures by years are given in Table III on the preceding page.

Functions of the street railway and the private automobile are not identical, the report states, and one will never satisfactorily supplant the other. If twice as many private automobiles were in use as at present the need for public transportation service would be as imperative as it is now, and the railway would still be a vital and essential public necessity. Further increase in the number of automobiles will bring about new problems for those who use them. Parking space will be in greater demand. In fact, with double the number of automobiles in use, the traffic on the railway would probably be materially increased. Moreover, the automobile stimulates the riding habit and has done more to impress the public with the necessity of good transportation than has any other one thing. To those familiar with the cost of automobile transportation the railway's need for a living rate of fare is better understood and its economical advantages appreciated.

TABLE IV—PROPOSED ADJUSTABLE FARE SCHEDULE

	A	B	C	D
Adult cash fare per zone, cents.......	5	10	10	10
Children, cash fare per zone, cents.....	5	5	5	5
Ticket fare per zone, cents............	..	6.25	8.33	..
Number of tickets or tokens for 25 cents	5	4	3	..

In Colorado Springs the railway is an essential and necessary public utility. Its tracks are located so as to care adequately for the present and future requirements of the community and to provide a basis for economical public transportation. Both the growth and welfare of the district socially and commercially are dependent upon the continuance of its operation. This must be either by the Stratton Estate, the city or some other responsible agency. As the city has recently acquired the property of the local electric light and power company the chances for interesting an outside organization are slim and the possibilities for future ownership apparently narrow down to a choice between the Stratton Estate and the city.

If the trustees of the estate are to continue to own and operate the property they should be permitted to do so the report states, under conditions that will be fair both to them and to the city. A franchise should be entered into that will permit the railway to earn operating expenses and a reasonable return on the investment. Among other things it is recommended that the franchise provide for an adjustable fare schedule based on the cost of rendering service, and an equitable adjustment of the tax situation. For rate-making purposes a fair value of the property should be determined and agreed upon and a reasonable rate of return fixed. An adjustable fare schedule of this kind is shown in Table IV. This provides an even money schedule with no penny changing or annoying delays by adjusting the intermediate fare rates through ticket sale. The minimum sale unit of 25 cents is within the reach of all regular riders. Transfers will be free.

A barometric fund of $75,000 should be provided to cover the wide seasonal variations in traffic. Whenever the cost of service exceeds the gross revenue by more than $50,000, thereby reducing the $75,000 fund to less than $25,000, the next higher rate provided in the schedule should automatically become effective on the first day of the next calendar month and should continue in effect during a period of at least three months. On the other hand if the normal fund be increased by more than $50,000, making it in excess of $125,000, the next lower rate of fare should automatically become effective on the first day of the next month. In no event should the fare be changed more than once in three months and then with not less than five days notice. It is to be understood, however, that there would be nothing to prevent the company from voluntarily lowering the fare at any time should it so desire. Estimates of the number of passengers to be carried and the revenue produced under present and proposed rates are shown in Table V.

TABLE V—ESTIMATED EFFECT OF PROPOSED FARES

Schedule	Annual Revenue Passengers	Total Passenger Revenue	Revenue Per Revenue Passenger (Cents)
A	6,350,000	$317,500	5.00
B	5,640,000	371,575	6.58
C	5,040,000	424,907	8.42
D	4,610,000	449,475	9.75
Present	5,278,850	425,475	8.06

Most of the car lines are now routed through the business center of the city from one residential district to another. These lines are fairly well balanced, the investigation showed, and with the exception of minor adjustments in the amount of service required few changes are suggested. The present and proposed routing is shown on accompanying maps.

It is recommended that the use of old heavy cars for passenger service be entirely eliminated. By this means the number of two-man car-hours will be reduced 26,556 per year. The schedule speed should be increased from 9.99 m.p.h. to 11 m.p.h. This, with the excellent track, broad streets, easy grades and few stops per mile, will do much, the report states, to remove the prejudice that street cars are slow. This has been created in the minds of the passengers largely by the fact that stops have been unnecessarily long because many of the operators are slow in opening and closing the doors. After making provision for paying a bonus for one-man operation an annual saving of $29,000 in trainmen's wages should result from the substitution of one-man cars for the present combination service.

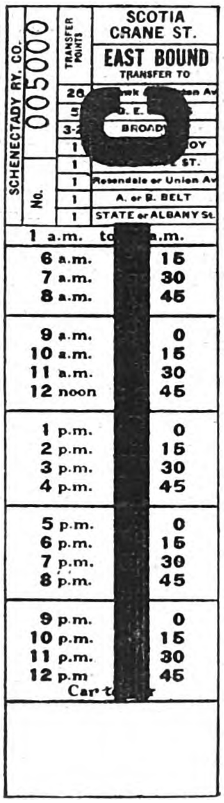
A study of the present power requirements showed that for each heavy car-mile operated approximately 3.78 kw.-hr. were required and for each Birney car-mile 1.51 kw.-hr. Applying these rates of energy consumption to the proposed schedules it is estimated that 2,300,000 kw.-hr. will be required annually. The report states that energy can be purchased from the city at 0.9 cent per kilowatt-hour, including the labor required to maintain the overhead system. Such an arrangement would result in a substantial saving for the railway and at the same time afford the new municipal plant an enlarged output and an improved load factor. It is recommended that power be purchased and the company's power station be held in reserve for emergency use. A total saving of about $31,000 a year is predicted in power cost.

Taxes are levied against the company under thirteen different classifications, the principal ones being the state corporation license, pole and wire tax, state and county tax, street paving and school tax. It is estimated that the total amount of taxes for the year 1924 will be more than $51,000. This is 11.67 per cent of the gross revenue, or higher by 50 per cent than the charges in other comparable cities. It is recommended that street paving assessments be reduced, special license taxes be removed and franchise taxes based on gross income be eliminated.

Various other economies are recommended in the report. It is estimated that under the proposed methods of operation total operating deductions will be $314,525 a year as against $426,386 at present. Applying this figure to the estimated revenue under the four proposed rates of fare it is found that schedule A will result in a deficit of $59,695 and schedule B in a deficit of $5,620.

On the other hand, it has been estimated that schedule C should result in a surplus of $47,712 and schedule D in a surplus of $72,280. Adoption of schedule C, therefore, would make the first mortgage bonds marketable and permit a small interest payment on the capital stock. The report recommends that a new franchise protecting the railway from unwarranted competition and reducing the present heavy tax burdens be granted the company. Adoption of schedule C and the economies recommended in the report would then enable the railway to continue operation on a firm and satisfactory basis.

Red Band on Transfer Indicates Direction



SCHENECTADY RY. CO.

No. 005000

TRANSFER POINTS

SCOTIA
CRANE ST.

EAST BOUND

TRANSFER TO

26	wk ton Av
5	D. E.
3-2	BROAD
1	OY
1	ST.
1	Rosendale or Union Av
1	A. or B. BELT
1	STATE or ALBANY St.

1 a.m. to a.m.

6 a.m.	15
7 a.m.	30
8 a.m.	45
9 a.m.	0
10 a.m.	15
11 a.m.	30
12 noon	45
1 p.m.	0
2 p.m.	15
3 p.m.	30
4 p.m.	45
5 p.m.	0
6 p.m.	15
7 p.m.	30
8 p.m.	45
9 p.m.	0
10 p.m.	15
11 p.m.	30
12 p.m	45

Car t

New Directional Tear-Off Transfer Adopted by the Schenectady Railway

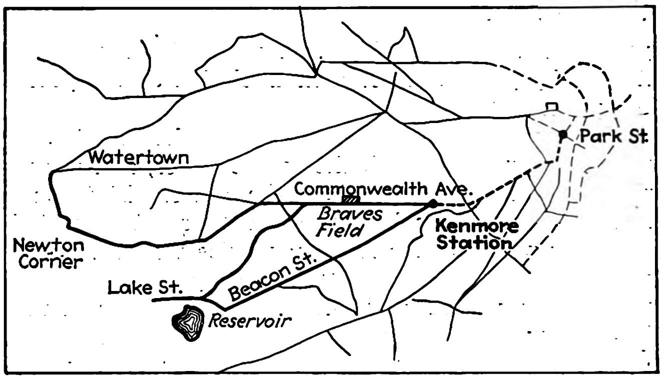
A NEW form of directional tear-off transfer was adopted by the Schenectady Railway on March 1, to supersede the old-fashioned punch transfer formerly used. In many respects the new type is similar to that used by the Bangor Railway & Electric Company, Bangor, Me., and described in the issue of this paper for Sept. 13, 1924, page 392. The transfer holder is also similar. A feature of the new design is a perpendicular red line which appears on all outbound transfers to enable the operator to distinguish at a glance between outbound and inbound transfers.

Each line has a different color transfer. The name of the issuing line is printed in large type at the top and the lines on which it is good are shown on the face. Opposite each line is a number indicating the transfer point, while on the back a corresponding number tells the location of the transfer point.

Instead of printing the ordinary date, one of a series of twenty letters is used for this purpose. This is more flexible and eliminates waste. A somewhat similar arrangement used by the Stone & Webster properties, southeastern district, was described in ELECTRIC RAILWAY JOURNAL for Oct. 4, 1924, page 548.

Stop Elimination Speeds Up Service in Boston

SIGNIFICANT reductions in running time have recently been made by the Boston Elevated Railway on three important lines. The first step in this direction was taken on Dec. 1, 1924, when seventeen stops were eliminated on the Beacon Street line between Kenmore Station and the reservoir. This line operates via the Boylston Street subway from Park Street to Kenmore Station and beyond that point on the surface via Beacon Street to the end of the route. Three-car trains operate on a three-minute headway during the rush. At other times two-car trains or single units are used and the headway is longer.



Important Reductions in Running Time Have Been Made by the Elimination of Stops on Three Heavy Lines of the Boston Elevated Railway

The old running time from Kenmore Station to the end of the line was fourteen minutes, and it was extremely difficult to keep cars on time. The new spacing of stops averages four to the mile and the running time has been reduced two minutes in each direction, or four minutes a round trip. Moreover, the company has found that it is easier to keep cars on time with the fast schedule than it was with the slower schedule.

Some opposition developed at first to the elimination of certain stops. To satisfy the complaints three were restored, leaving a net gain of fourteen. On April 1 the same plan was adopted for the Lake Street line and the Newton-Brighton-Watertown line. These routes are operated with trailer trains on three-minute and 3½-minute headways in the rush hour. Single cars are operated only for short periods.

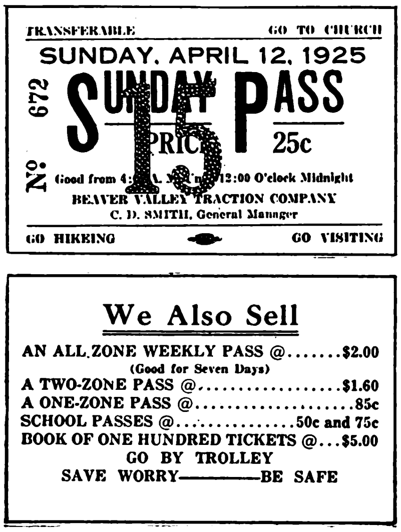
Between Watertown and Kenmore Station six minutes are saved on the round trip. Between Lake Street and Kenmore Station the saving per round trip was four minutes. This reduction in running time has so pleased patrons of the railway that requests have been made by the public for the elimination of other stops. The company is planning to accomplish savings on other routes by the adoption of a similar plan.

Three-Car Trains On Beacon St. Near Kenmore Station

Beaver Valley Traction Introduces Sunday Pass

ON EASTER SUNDAY, April 12, the Beaver Valley Traction Company, which has been using a great variety of adult and school weekly passes since Feb. 13, 1922, added a pass good for Sundays only. The price of 25 cents compares with a fare of 5 cents per zone, but as the pass is available for all the trolley zones of the company it is possible to ride the full eleven zones (20 miles) between Leetsdale and College Hill and then take a few more trips on side routes. Examination of the Sunday pass as reproduced shows that it not only suggested excellent uses, but also the back was utilized to push the sale of the weekly pass.

In its more than three years of pass experience, the company has increased weekly pass sales from $513 to approximately $2,100, which represents a maximum sale of nearly 1,700 passes at prices ranging from 50 cents for a school pass to $2 for an all-zone adult pass. Because of his belief and enthusiasm in the pass plan, C. D. Smith, general manager, has found it possible to increase sales by more than 30 per cent over the same months a year earlier. This has been achieved partly by seeing that all the car operators were always kept amply supplied, partly by placing the pass on sale at five different stores and partly through advertising.



TRANSFERABLE GO TO CHURCH

SUNDAY, APRIL 12, 1925

№ 672

SUNDAY PASS

PRIC 25c

15

Good from 4:[illegible] 12:00 O'clock Midnight

BEAVER VALLEY TRACTION COMPANY

C. D. SMITH, General Manager

GO HIKEING GO VISITING

We Also Sell

AN ALL ZONE WEEKLY PASS @.......$2.00
(Good for Seven Days)
A TWO-ZONE PASS @..................$1.60
A ONE-ZONE PASS @.....................85c
SCHOOL PASSES @...............50c and 75c
BOOK OF ONE HUNDRED TICKETS @...$5.00
GO BY TROLLEY
SAVE WORRY——BE SAFE

Front and Back of Sunday Pass Introduced by the Beaver Valley Traction Company on Easter

When the Sunday pass was introduced, Mr. Smith went still farther in sales effort, for department heads and office employees were also enlisted as salesmen in addition to those selling the weekly passes. The colored janitress with a sale of 25 passes actually did better than all other employees outside the car operators. Two of the latter were tied for first place with a sale of 90 passes each. Prizes of $3, $2 and $1 had been offered as an incentive for the first Sunday.

So far as actual revenue is concerned the idea of putting more life into the Sunday riding proved a success. In addition to the 1,559 weekly passes still good on Easter Sunday, the last day of the pass week, the company sold 1,341 Sunday passes. As only 2,000 passes had been printed, a number of operators found themselves running short before the day was over.

The revenue from the Sunday passes on April 12 was $335; adding this to the cash fares and pro-rated weekly pass receipts of $1,079 gave a total revenue of $1,414, compared with $1,382 on Easter Sunday in 1924. Last year's Easter Sunday, however, included $58 on the Riverview line, which is now operated separately as a part of the Beaver Valley Motor Coach Company. Therefore, the comparative figure for last year is $1,324 and the gain in revenue becomes $90 or nearly 6.8 per cent. Even though Easter of this year was a more pleasant day than Easter of 1924, the management is inclined to the belief that the Sunday pass was the cause for the increased revenue. It has good grounds for this in the fact that the two preceding Sundays, April 5 and March 29, ran $132 and $93 respectively under the two Sundays preceding Easter, 1924.

As was true at Pittsburgh, the Sunday pass proved a particular hit with children. The trainmen also reported an unusually large number of young couples, due, probably, to the combination of Easter finery and Sunday passes.

One incident that showed the immediate ride-creating power of the pass was that a maid who had been engaged by the wife of a company official called in person to state when she would begin her duties. The girl said that she had intended telephoning, but as she had bought a Sunday pass it occurred to her that a personal visit would be more satisfactory.

The Readers' Forum

Fair Attitude Commended

CITY OF DETROIT
Department of Street Railways
May 23, 1925.

To the Editor:

I want to congratulate the JOURNAL upon its fairness and broad-mindedness in printing the editorial of last week which commented upon our third anniversary. I think you have shown that you are one trade paper in a thousand, by your boldness and fairness in making the statement you did. Altogether, I think such an attitude is a mighty healthy one and augurs well for your influence on the entire electric railway industry.

We, here in Detroit, do not believe that municipal ownership and operation is a general panacea to be applied everywhere. On the contrary, we would be absolutely against the idea of this type of ownership and operation in the majority of the cities in the United States. What this operation has demonstrated to the writer is that were the actual professional street railway men of the companies allowed to do the job as good craftsmen would wish to do it, there would be a great deal less ailing in the street railways of the country.

ROSS SCHRAM,
General Manager.

Safety Council Emphasizes Need of Sustained Effort

NATIONAL SAFETY COUNCIL
CHICAGO, June 1, 1925.

To the Editor:

It is a pleasure to read the editorial in your issue of May 23 entitled "Sustained Effort Is Necessary to Achieve Results in Safety Work." The electric railway companies and the community organizations that have accomplished permanent results in the reduction of public accidents know that spasmodic and spectacular campaigns often accomplish more harm than good. We go so far as to recommend that a "Safety Week" or similar campaign should never be undertaken except as the beginning of a permanent, continuous program of public safety education.

S. J. WILLIAMS,
Director Public Safety Division.

Association News & Discussions

Well-Balanced Program at Mid-West Meeting

Use of Buses by Electric Railways, Track Construction and Maintenance Costs, Improvements in Equipment, Safety Work and Bus Regulation Were Among the Subjects Discussed

ONE of the most successful meetings ever held by the Mid-West Electric Railway Association took place at the Baltimore Hotel in Kansas City, Mo., May 25 and 26. Papers on subjects ranging from co-ordination of rail and bus transportation to the maintenance of track were actively discussed by some 150 electric railway men present and furnished the basis for a comparison of experiences and practice.

Under the subject of "Co-ordinated Transportation," F. G. Buffe, general manager for the receivers Kansas City Railways, not only presented an exhaustive discussion of the place of the bus in the modern scheme of transportation but also outlined some of the principal design requirements for present-day city bus operation. This paper is abstracted elsewhere in this issue.

In a paper on "Track Construction and Maintenance Costs" R. H. Findley, superintendent of track and roadway Omaha & Council Bluffs Street Railway, called attention to the importance of unsprung weight on cars as a factor in the life of electric railway track. An abstract of the paper appears elsewhere in this issue.

Ernest Stenger, president and receiver Denver Tramway Company, expressed his gratification at the large attendance and keen interest displayed during the meetings. He pointed out the value of sectional association activity, holding that such meetings supplement the work of the American Association by bringing railway men in a given territory together for better acquaintance and understanding of sectional interests. He laid particular emphasis on the importance and value of frank and informal discussion of common problems.

Other papers on important present-day railway subjects rounded out a well-balanced program and helped to stimulate discussion. Taking up the matter of organized safety work, B. Hilburn, general manager Tulsa Street Railway, Tulsa, Okla., said that accident prevention has a broader significance than the mere saving of injury claims. From the humane standpoint it affords the opportunity for the conservation of life and limb, and in addition to that is of material importance in building good will through the reduction of injury law suits. Another important result obtained from properly organized safety work was held to be the constructive effect of interest aroused in the mind of the operator, upon his general attitude toward his work and toward the public. With this end in view, the safety organization in Tulsa, Mr. Hilburn said, combines the work of accident prevention with what is generally termed welfare work. This activity is handled through a central committee which directs the work of sub-committees and of team captains. These subcommittees include a "safety committee," an "equipment committee" and a "publicity committee."

Constant vigilance is necessary to avoid lagging of interest in this activity, and a safety director is employed to devise new ways of arousing interest and keeping the work active. The personnel of various teams is selected by the elected team captains. Each captain chooses the members of his team in rotation, until all employees are selected. The organization of these teams is broken up frequently so as to prevent discouraging the individuals on a particular team .which ends the contest with a low record.

In grading the teams, the nature and consequences of each accident, rather than number of accidents reported, are considered by the central committee. Any negligence of the operator receives careful consideration, with the result that the trainmen members of the central committee receive invaluable first-hand knowledge of the character of negligence which results in accidents. This general plan was started in February, 1923, in Tulsa, and resulted in a reduction of accidents reported in 1923 to 865 as compared with 1,560 in the year 1922. At the same time accident law suits were reduced from eleven, involving $146,000 in claims for 1922, to five involving $71,000 in 1923. In 1922, $9,280 was paid in claims without litigation, while in 1923 this was reduced to $2,831.

IMPROVED DESIGN REDUCES MOTOR MAINTENANCE COST

Steps which have been taken by manufacturers in the reduction of first cost and maintenance of car equipment were outlined in a paper by J. C. Thirlwall, General Electric Company. He said that weight reduction affords a ready method of reducing first cost and power consumption, but that ultimate saving is dependent on holding down maintenance cost as well. Figures were cited to show that a balance between these various factors had apparently been made on commonly used modern types of equipment, both single and double truck.

Modern types of motor equipment, Mr. Thirlwall held, have effected material reductions in maintenance costs over older and heavier motors. Even when equipped with modern gears, improved bearings and better brushes, lubrication and insulation, the average maintenance cost of many of these older and heavier types of equipment, he said, ranges from $3.50 to $4 per 1,000 motor-miles, while modern and lighter motors are being maintained for from 50 cents to $1 per 1,000 miles. This reduction was attributed to improved design, the use of higher grade materials and better construction in the motors. At the same time it was pointed out that improved maintenance practices and machinery have helped to bring these costs down.

As an illustration of the improved performance of modern motors, records of the Connecticut Company for the years 1922, 1923 and 1924 were quoted. According to these figures, older motors of the GE-67, GE-70, GE-80, GE-87, West.-68, West.-93 and West.-101 types were operated a total of 143,000,000 motor-miles with 1,057 armature rewinds, or an average of 135,000 miles per rewind. During the same period, modern motors of the GE-200, GE-203, GE-258, GE-264, West.-506, West.-508, West.-532 and West.-632 types were operated a total of 144,000,000 motor-miles with only 524 rewinds. Most of these later motors had been in service for periods varying from five to ten years, but showed more than double the mileage per rewind of the older designs. Troubles from field, bearing, brush-holder and commutator lead failures showed still more favorable records for the more modern designs of both manufacturers. The very light, low-wheel, high-speed motors used on light-weight single-truck and double-truck cars were operated 12,400,000 motor-miles during the year 1924 with only seven armature rewinds. The average age of these machines, which included GE-258, GE-264 and West.-508 equipments, was about 4½ years.

Another example of the savings that are made by modern equipment and modern maintenance methods was given. In this case, on a large Eastern property the mechanical department spent an average of $1,420,000 annually on the maintenance of car equipment during the years 1918, 1919 and 1920. After a large part of the rolling stock had been replaced with modern cars, and the inspection and maintenance methods and facilities had been modernized, the average expenditure during the years 1923 and 1924 was reduced to $835,000. Mr. Thirlwall testified that the equipment on this particular property was in much better and more reliable condition than when the larger maintenance expenditures were being made.

Better Bus Regulation Needed

Recent transportation legislation in the territory embraced by the Mid-West Association was discussed by O. Q. Claflin, chief attorney Kansas City, Kaw Valley & Western Railway. As important recent legislation of this type had been enacted in the state of Kansas, he explained some of the features of the bus regulatory law recently passed in that state. He said that preliminary work on a measure of this kind had been started two years before, and that during the last session of the Kansas Legislature no less than five different bills were introduced. One of these was finally passed, but Mr. Claflin contended that this was far from a satisfactory measure. He objected particularly to the method provided in the new law for fixing the tax on buses, and maintained that a ton-mile tax is the only proper and fair method of apportioning a fair part of the cost of road maintenance on buses in proportion to their use of the roads.

During the legislative session there was a general sentiment in favor of the passage of some sort of bus regulatory measure. Several different methods of fixing the tax rate were proposed. These included both a vehicle unit rate and a seat capacity basis. Instead of the ton-mile tax, however, a modified unit rate varying from $40 to $230 per bus per annum, depending on capacity, was adopted.

Under the new law, Mr. Claflin explained, the function of the commission will be primarily the issuance of certificates of convenience and necessity. All bus carriers operating at a given time specified in the act will be presumed to be convenient and necessary unless proved to be otherwise by evidence submitted to the commission. In regard to convenience and necessity, Mr. Claflin said, there will probably be some difficulty in determining how inland towns previously without transportation may be served by buses without competing with existing rail lines over certain parts of their routes.

In the preparation of evidence before the commission looking to the elimination of destructive competition, he advocated greater stress on the subject of the character of service now rendered by electric railway lines, and advised against laying so much stress on the damage done to railway receipts by the bus competition. He said that the adequacy of existing service must be established to prevent the issuance of a certificate.

Due to the unfair advantage which is given to buses by allowing them to use the highways at low cost, he said that the Kaw Valley line is considering asking the next Kansas Legislature to pass a law giving the commission the right to maintain the present railway right-of-way, and to allow the company to furnish rail transportation at a rate of 1 cent per mile one way or 1¾ cents per mile for the round trip.

All of the papers presented during the meeting were discussed from many angles, and the subject of legislation received particular attention. R. B. Campbell, general manager Arkansas Valley Interurban Railway, agreed with Mr. Claflin that the ton-mile tax basis is more scientific than a flat vehicle rate, but called attention to the fact that even this method of apportioning road maintenance cost eliminates the factor of speed. He said that at a conference of electric railway operators, held to consider the legislative program, some had advocated a gross receipts tax in preference to other methods. In Kansas, the ton-mile tax was considered to be more complicated than a flat rate, and consequently more expensive of collection.

Mr. Campbell maintained that the regulatory features of the bus law are of more importance than the matter of taxes. He held that inclusion of the requirement for establishing both convenience and necessity is an important provision in the new measure from the standpoint of protecting existing rail facilities.

Mr. Campbell explained the action which is being taken by the rail and bus companies with which he is connected for testing the new law and establishing a precedent under its provisions. As president of the Arkansas Valley Transportation Company, a bus operating organization which is competing with the existing rail line of which he is general manager, an application has been filed for a certificate of convenience and necessity. As an official of the Arkansas Valley Interurban Railway he is opposing the granting of this certificate on the grounds that the service now rendered by the rail line answers all the reasonable requirements for public transportation in the territory served. Mr. Campbell explained that this proceeding is being instituted frankly before the commission with the expectation that the request for a certificate to compete with the rail line will be denied, thus establishing a precedent for the administration of the new act where proper service is now being rendered by rail lines in the state. Commenting further on Mr. Claflin's views, he maintained that it is important for evidence before the commission to show financial injury caused by bus competition, since such financial injury directly affects the ability of the existing road to render proper service in its territory. Mr. Campbell also said that it is difficult accurately to define common carriers under the terms of the new law, and that the possibility for many technical variations in this definition will require close study on the part of those interested in the enforcement of the measure. Mr. Claflin held, however, that the requirement for issuance of a certificate of convenience and necessity is not a cure for unfair competition between buses and rail lines. He maintained that the bus must be taxed an amount which will put it on a comparable economic basis with rail lines which maintain their rights-of-way, pointing out that only under these conditions will a true comparison of both the relative cost and convenience of the bus and the railway be possible and fair.

Mr. Buffe pointed out that one of the serious problems in obtaining constructive legislation is that of getting all railway interests to agree on a general program. He insisted that electric railway men should be the last to advocate restrictive taxes of any kind—on buses or anything else. Instead, he maintained that they should be united in advocating reduced taxes on existing transportation agencies and relief from such forms of indirect taxes as paving costs.

The status of bus regulation in Colorado was explained by Mr. Stenger. He said that under the Colorado law a certificate of convenience and necessity must be obtained by a bus line only if the proposed service is competitive to an existing rail line. In view of the constantly changing conditions and rapid development taking place in the use of the bus as a common carrier he felt that it is very difficult to foresee a proper bus legislative program, but expressed the conviction that, under any circumstances, the bus must pay its own way for the maintenance of the highways. Otherwise, he pointed out, we will be living on the cream of highway transportation facilities today and leaving only the skimmed milk—in the form of badly depreciated roads—for the next generations. He said that if the intercity bus can furnish a better service more economically than the interurban, it must inevitably displace the rail carrier. However, to avoid serious economic waste, the bus must assume its proper burden of road maintenance cost, and this must be done before the interurbans are badly crippled by economic favoritism to the bus. He advocated the principle of making the user pay for the maintenance and upkeep of the roads, as a sound, economic policy. As an illustration of the importance of the subject he said that one road in New York had been rebuilt four times while the bonds issued for the original construction were still unpaid. In England, he added, where some of the roads are much older than in this country, and where more experience has been obtained in the cost of their upkeep, the cost of road maintenance assessed against a Ford car is about $140 per year.

Similar frank discussion took place of all of the other papers that had been presented. At the annual banquet, held on Monday night, Judge Charles H. Mayer, general counsel St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., made a plea for co-operation among railway men in the attack on their many problems, and pointed out that such co-operation would inevitably develop a leader with the vision and courage to carry the transportation banner to economic victory.

The following officers and directors were elected for the ensuing year: President, R. B. Campbell; secretary, treasurer and general manager Arkansas Valley Interurban Railway; vice-president, A. E. Reynolds, vice-president and general manager Springfield Traction Company, Springfield, Mo.; secretary-treasurer, J. A. Weimer; executive committee, H. B. Cobban, F. G. Buffe, R. J. Lockwood, E. Stenger.

Future of the Bus and the Electric Railway*

Present Indications Are that the Public Will Demand Bus Transportation in Every City of Considerable Size—For Best Results Such Service Should Be Operated by the Electric Railways and Co-ordinated with Their Service—Requirements in Bus Design Outlined

By F. G. Buffe

General Manager for the Receivers Kansas City Railways

YOU gentlemen are no longer in the street railway or the interurban business. You are transportation men engaged in moving passengers and freight. Instead of a one-price, one-item store we are entering the transportation department store business, where we won't have to turn away customers because our line is limited. From now on we are really going to merchandise tranportation.

The street railway industry has made a long and heartfelt study of the bus situation, although in some instances the study has been too long and procrastination has proved expensive.

There was a tendency a few years ago to take the position that the bus had no fixed place in urban transportation and a disposition to sidetrack bus propaganda. But the idea spread and as more installations were made, the fact was soon recognized that the bus was inevitable. There was some talk of feeder lines and auxiliary service, but the last twelve months have brought a revolutionary change in thought and practice. In a very short time there will be no city of importance that does not have bus transportation.

At the meeting of the executive committee of the American Electric Railway Association in Washington on Feb. 16 a broad policy regarding the motor bus was unanimously adopted. It accepts the bus from headlight to taillight and states the only proper attitude towards competition. It assures the public that the members of the association realize their duty to furnish good public service, and that whatever is essential to such service will be furnished by these recognized and regulated transportation agencies. It calls for uniform regulation, the lack of which today is one of the weak spots in the entire bus situation. It recognizes a liability for reasonable proportionate taxes and other public obligations.

From a strictly street railway viewpoint it is comforting of course to agree with the first statement of these principles, "that no medium has yet been developed which alone can take the place of the electric railway in moving large numbers of persons in the rush hours in cities," but times and methods change rapidly and the bus is developing so fast that in a short time this statement may need modification. Undoubtedly there is nothing yet that can practically or economically replace street cars for mass transportation, or that can supply a similar service at as low a rate of fare, or that can give the same universal transfer system.

It is not likely, in the very nature of things and as our modern cities are now constituted, that the bus will ever be permitted to assume such a task, but this does not detract from the fact that motor buses in London are moving more people than are surface lines, nor does it weaken the statement that motor buses are now being built which can consistently handle rush-hour business with a comparatively slight increase in the number of units, and with a very small percentage of the total capacity as a standing load permitted. However, for all general purposes there is no danger of anything supplanting the present system, and it just as well that we nail our flag to the mast and stand by the ship. The outstanding point is that street railway men have quit thinking in terms of street cars and have broadened their vision and their jobs so that they have become transportation organizations, ready and willing to furnish motor bus transportation in co-ordination with street railway service wherever there is a field or a reasonable demand for such facilities.

You can't put the bus in a side street in a neglected suburb and satisfy the public demand. The average citizen wants to see and use buses on downtown routes and on the principal streets of his town. He is demanding real bus transportation. He wants a bus when he wants it, and present indications are that he wants it in every city in this country, and unless the present transportation organizations give it to him he is going to find some one who will.

For one man who is really concerned with the economics of the transportation situation, there are thousands who think about it not at all and care less, as long as they have what they consider is the proper transportation service. Whether Dick Smith or Tom Jones or the railway company operates the bus lines is with them a matter of little concern.

The motor bus is no longer a theory, no longer a threat, no longer the dream of visionaries, no longer an instrument for adventurous souls with lots of nerve and little credit—it is here now, today, as a recognized, popularly acclaimed unit in the transportation scheme. As Boss Tweed once said, "If you can't lick 'em, join 'em," and the mourners' bench is crowded with hard boiled street railway men who are busy joining. I know, because I am one of the joiners. Any transition period is troublesome, vexatious, full of mistakes, and often economically wrong, but these things don't stop transition, which is another way of spelling progress.

Revolutionary methods are expensive but they can't be stopped. As street railway men we have felt sure that mass transportation from the standpoint of economy, from that of congestion, could best be handled by large, electrically propelled units on steel rails. That position has seemed sound. It doubtless is, but changes are rapid. It was only a few years ago that many were of the opinion that buses were expensive and unprofitable. Then they were rather drudgingly accepted as possibilities for feeders or limited auxiliary service. There was a brief period of experiment with the trackless trolley, and now in almost every city street railway men are talking buses, planning buses and buying buses.

It will perhaps be an interesting fact to many, as it was to me, that in London there are more motor buses in regular operation than there are surface or subway cars. London has a total of 4,800 motor buses as against 2,585 surface or underground cars. There are in addition a number of suburban tram systems and much suburban steam road traffic. Of the 2,691,000,000 passengers handled by buses, tramways and undergrounds, the buses carried 1,214,000,000, or more than 45 per cent of the total.†

While London does not have the private automobile congestion of our larger American cities, it would seen that the tremendous number of these vehicles and the large percentage of passengers handled by them would to some extent weaken the argument that mass transportation cannot be handled by any other vehicle than a street car. This percentage becomes larger when we compare the number of passengers transported by London buses as against the number carried by surface tramways. Last year the tramway systems in London transported 909,000,000 people against 1,214,000,000 for the buses.

There have been many verbal bricks thrown at bus manufacturers, some of them justified and some of them on general principles. Without doubt individuals selling buses have been guilty of muddying the waters. Some have financed competition; some have invaded fields in which they had no business. But my observation is that most of them want to be good and are anxious and willing to join forces with the electric transportation companies. There are always two sides to a story, and before we condemn we should get the facts. I have personally investigated several of these tales that float around and found that my impressions were wrong, my information faulty, and my conclusions at times at variance with the facts.

Several years ago the bus manufacturer was in an uncomfortable position, and like Hamlet didn't know whether to suffer the slings of fortune or do something to end them. He had a plant, an organization and a good, marketable product. On every hand truck factories, fire engine factories, wagon factories, automobile factories, were going into the bus field. He was besieged by Tom, Dick and Harry for surveys, prices and help in establishing bus lines. Street railway men were hostile and were moving heaven and earth to stop the spread of the bus idea. The manufacturer who desired to co-operate and to work out transportation problems with the street railway companies saw competitors step in and take the business. He was between the devil and the deep sea. In one city he was in bed with the street railways and in another he couldn't eat in the same restaurant. So perhaps we shouldn't be too critical of the past two or three hectic years.

---

*Abstract of paper presented at the annual meeting of the Mid-West Electric Railway Association, Kansas City, Mo., May 25-26.

†See ELECTRIC RAILWAY JOURNAL, Sept. 20, 1924, page 425.

The wide-awake legitimate manufacturer realizes that electric transportation companies are his best customers. Their credit is good; the transportation problem of the cities is in their hands; and in the very nature of things competition is an impossibility in a business that is a natural monoply.

My personal opinion is that the slate should be wiped clean and that we should accept the broadminded, progressive bus manufacturer for what he earnestly desires to be, a friend. The scalawags and trimmers can soon be discovered and read out of the congregation. The company which encourages competition; which stirs up trouble; which finances dummies; which gives commissions and bonuses to politicians or others; which misrepresents facts; will be found out and will be a maverick without friends either in the street railway or the bus field.

Transportation, especially urban transportation, is a natural monoply except in the extremely large centers of population, and even in those it would be better if all transportation facilities were under one direction. From the very nature of the business competition in mass transportation facilities cannot continue. Due to rush-hour conditions, the single fare system, extensions of city areas and the consequent demand for service, the necessity of supporting non-paying lines in the development stage, all possible revenue is required to support the facilities necessary for a complete, city-wide transportation system.

The introduction of the motor bus has often resulted in competition, and unfortunately, the bus has been allowed to compete unfairly in being given the advantages of short hauls, heavy traffic density and escape from paving and tax burdens. Where such a condition continues the street railway will eventually be so crippled that it can no longer provide a uniform service at its present fare.

In the end the public pays the price of such costly experiments. There are numerous examples where heavy bonus prices have been paid by street companies in order to stop disastrous competition, and the interest charges on such investments must in the end be passed on to the public or lost by the investor.

Just what do we mean when we say co-ordinated transportation? Webster says co-ordinate means "Equal in or of the same rank, order or importance, not subordinate." Also, "To adjust; harmonize." So co-ordinated transportation would imply an adjustment of transportation facilities. It implies furnishing the service the public desires, not making one method subordinate to the other but fitting each type to its proper field so as to avoid duplication, and at the same time render a more efficient and a more desirable public service.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 10-12—**Canadian Electric Railway Association, Montreal, Quebec.**

June 16-19—**Society of Automotive Engineers, White Sulphur Springs, West Virginia.**

June 22-26—**American Institute of Electrical Engineers, Saratoga Springs, N. Y.**

June 26-27—**New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

July 22-25—**Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

Oct. 5-9—**American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

Before the advent of the automobile our cities developed along transportation arteries. But with the almost universal ownership of private transportation there has been a decided change in the method of growth. Wide areas have been developed away from car lines. New sections have been opened and in every city extensive boulevard systems afford transportation paths for thousands who drive their own cars.

It is this new field we must tap if we can. In planning our co-ordinated system we should utilize the boulevards and compete with our own car lines as little as possible. We should try not only to serve such unserved territory but to sell our wares to new customers and bring back our old ones.

There are, of course, dangers to be avoided, pitfalls that lie in wait, and attention should be called to them and our energies directed to avoiding them. Taxation, excessive extensions, universal transfers, low fares, car line competition, adverse legislation, must all be watched.

There is already a tendency on the part of public officials to burden this infant transportation with taxes, and unless stopped its extension and success will invite new attacks; city gasoline tax, state gasoline tax, street and highway taxes, war tax, city, county and state personal and property taxes, present an imposing and dangerous array. Reasonable taxation is right and proper, and bus transportation should shoulder its proper share of the public burden, but this is no excuse for the imposition of unreasonable taxation. It is unjust to base a tax upon the pavement wear of a 15,000-lb. double-deck bus running on 6-in. pneumatic tires, when 35,000-lb. sand trucks on solid tires are using the same pavements without tax.

Unwise extension of bus service is another peril that is all the more dangerous because it can be so readily sugar-coated. A new bus line requires nothing but the buses and a schedule. There will be pressure of a serious nature to open new territories, to run buses on car line streets, and unless restricted an otherwise profitable bus system can be throttled by such parasite lines.

The universal transfer and the low fare present another difficult problem. There can be no good reason for either in a co-ordinated system except in the case of feeder or crosstown service. The bus is not the successor to the street car nor should a ride be sold at the same fare. The street cars furnish the low-fare, rush-hour, universal transfer service. The bus is a different vehicle offering a different service and the price should be in accordance. Even where transfers are given for feeder service the differential should be maintained.

Car line competition must be watched. Bus lines should be laid out so as to draw from car lines as little as possible and to reach and attract a new class of patronage. The rush hour belongs to the cars. There should be no large investment in rush-hour buses in a co-ordinated system. But schedules should furnish a good all-day service that will attract the shopper and without endeavoring to handle the peak-load crowd that would necessitate a large investment in short-hour buses.

To my mind, a seat for every passenger at a commensurate rate of fare is the greatest bus appeal. I do not think the private automobile has taken our business so much because of noise and the other so-called drawbacks of street cars as on account of the rush-hour crowds and the standees. People do not like to be crowded or stepped on or over. No man likes to get a seat only to give it up to a woman, no matter how gallant he may be.

There is every reason to forecast that bus transportation is just in its infancy, and even the most optimistic will be surprised by the development of the next five years. Outside of replacements in congested centers and on heavy lines, it is highly probable that very little new track will be laid, and bus service once instituted will gradually take the place of many sections now served by street cars. The cost of a mile of paved double track is in excess of $100,000, enough to buy ten to twelve buses, which would give a six-minute headway on a 5-mile route. A street railway system has only about 20 per cent of its total investment in rolling stock, whereas a bus system has more than 90. Kansas City has approximately $40,000,000 invested in street railway facilities, and has 747 passenger cars, or an investment of more than $53,000 per car. Twelve hundred double-deck buses would provide a seat for every passenger that these 747 street cars carry seated and standing, and the total investment would not be to exceed $15,000,000 in buses, shops and garages. To earn 7 per cent on the street car investment requires $3,700 a year per car, where an earning of $920 per bus per year will pay 7 per cent on the bus investment.

From the standpoint of the passenger a bus should be pleasing in appearance; provide a comfortable ride and be as safe as it is possible to make it. We are making a plea for more business and more riders, and are hopeful that the institution of bus service will attract riders from those now using their own private transportation. There is a psychological appeal through appearance and such details as seating, lighting, heating. The highest possible speed consistent with safe operation is not only necessary from the passenger viewpoint but also essential in the reduction of operating cost. The use of air is desirable in braking heavy units not only as a matter of safety, but in the relief to the operator from the fatigue incident to manually operated brakes. Air also permits interlocking safety features and air-operated doors, which not only make operation safer but increase speed and accelerate passenger movements. A low center of gravity and a correspondingly low step are important, as an insurance against the danger of turning over and for the comfort of passengers. A low center of gravity gives a feeling of stability, and low step heights are a large factor in preventing boarding or alighting accidents. Every attention should be paid to the passenger's comfort, which is influenced by the character of seats, the width of the aisles, the lights, ease of entrance and exit, floor and step heights, absence of body noise and vibration, ease of acceleration and retardation, etc.

From the operating standpoint economy is just as important as the public appeal. The margin between expense and income is small, and any tendency to increase operating cost would soon wipe out profits. A sturdy, dependable type of chassis is necessary; one that will require a minimum of repairs and maintenance expense. All parts should be accessible and so far as possible units should be interchangeable. The engine should be built for the service; should be designed for ease in taking down and should have a high torque and comparatively low speeds. It should be powerful enough for the service required.

There is no economy in a cheaply constructed, light bus that in a year or so will be requiring constant attention and high maintenance. A bus should be built for from 250,000 to 300,000 miles. In the life of such a bus the gasoline used will be more than the original cost of the bus, as will maintenance.

Speed is a large factor in economical operation, and due to frequent stops the maintenance of high scheduled speed in city transportation is extremely difficult.

The average bus makes from six to ten stops per mile and it is manifest, therefore, that the less time consumed in loading and unloading the greater the speed that can be maintained. Every facility should be provided to secure a rapid interchange of passengers. With comparatively narrow aisle and entrance, an air-operated exit door should be installed which will permit passengers to unload at the rear as others board the bus in front.

Double-deck buses should be designed for one-man, two-man operation, which can be secured through the use of air-operated doors and interlocking safety devices.

There is much to be said in favor of a steel body as against the wood construction now generally being used. Experience in street car building and operation has proved the advisability of steel. Such bodies are more substantial and are less noisy than wood. Their life is longer, and undoubtedly maintenance costs will be less. From the safety standpoint there cannot be any comparison.

The gas-electric drive has recently attracted much attention and several large installations are now being made. The electrical equipment consists of a generator directly connected to the motor, which supplies current to operate two electric motors directly connected by gears and pinions to the rear axle. This equipment can be installed on practically any type of chassis and many advantages are claimed for it. It is quieter, has a more simple control and provides a faster and smoother acceleration. The driver is relieved of the heavy labor of gear shifting, and there is no vibration or transmission noises. Less maintenance and greater fuel economy are claimed as a result of more uniform engine speed. Absence of skidding is also emphasized. The arguments against it are that it adds approximately 2,000 lb. to the weight and $1,800 to the cost of the bus.

There is now sufficient operating data to show that the bus is a very economically operated unit, averaging less than the cost of operating street cars. Single-deck operation, depending upon wages paid and the type of equipment, runs from 18 to 25 cents per mile. Double-deck buses can be operated with one man for from 25 to 28 cents per mile and with two men from 30 to 35 cents. These costs include all depreciation charges, overhead and insurance, and are conservative.

There are other favorable arguments for the bus in city operation, such as flexibility, curb loading, and unloading, and the ability to avoid traffic jams and blockades.

There is a large field for express bus service in our cities at a price of 25 cents or more, somewhere between the cost of an ordinary bus ride and a taxicab. There are many people who now drive their own automobiles who are willing to pay for comfort and speed, and such non-stop express service undoubtedly deserves serious consideration. This is a new and as yet practically untried field, but large cities with their widespread residence sections invite some better and faster transportation than the stop-to-stop service, and at the same time less expensive than the private car or the taxicab. Our job is to furnish transportation at a fair profit and meet the public demand and need, whatever it may be.

Factors in Track Construction and Maintenance Costs*

BY R. H. FINDLEY
Superintendent Track and Roadway
Omaha & Council Bluffs Street Railway, Omaha, Neb.

RIGID economy in the cost of operation of electric railroads has been so essential the last few years that many electric roads have taken advantage of the developments in construction methods and equipment made necessary by the increased cost of labor. Mechanical devices of all sorts, some almost human in their action, are now used in attempting to reduce cost of construction. Mechanical excavators, cranes, automatic buckets for handling bulky materials, pneumatic tools of all descriptions, dump cars, etc., are all in common use on the larger properties where the volume of work necessary makes their operation profitable.

These devices have effected large savings in cost of construction, in place of the old method of using large forces of laborers at prevailing rates of pay. Most other construction work in our cities has undergone a similar revolution. In this industrial age, an excavating machine rooting up pavement, etc., on a city street does the work of fifteen or twenty men. Likewise a truck will do the work of four teams and drivers. Concrete mixers of latest type are operated by five or six men with truck delivery of dry aggregates instead of 22 to 25 men as was formerly the custom. Pneumatic concrete breakers permit two men to do the work of six or eight in a day. Two men with unloading cranes will do the work of ten or twelve hand shovelers, and so on down the line. Considering the fact that some construction work is still of such a nature that a machine cannot be used to replace labor, it is probably true as a general average of all construction activities that the same volume of work is now done with from 35 per cent to 50 per cent fewer workmen than were used ten years ago.

The present laws restricting immigration are responsible in a great measure for this situation in the construction field. The falling off in immigration due to these limitations is about 1,000,000 per year, based on the pre-war rate of influx. This number of people distributed uniformly over the country would mean about 2,000 more immigrants per year into Omaha, or 3,500 more to Kansas City. It has been absolutely necessary, since the war, to overcome this labor deficiency. The only way to accomplish any great volume of work has been to use machinery as far as possible. In order to realize such economies the cost of equipment has created a high construction plant expense, due to interest, depreciation and repairs, which has considerably cut down the net apparent labor saved. Because of this plant expense, many of the devices now used would not be economical if common labor were as plentiful, cheap and efficient as in prewar times.

---

*Abstract of paper presented at the annual meeting Mid-West Electric Railway Association, Kansas City, Mo., May 25-26, 1925.

Selection of one or more of the very numerous types of track construction used today throughout the country, should be fundamentally based on the idea of reducing the track costs per passenger carried. Much can be said for each of the various types of construction, varying from the most rigid steel tie monolithic track to the very plainest types. Each has its advantages and disadvantages.

The widespread tendency toward the operation of lighter street cars should result in a material reduction in maintenance and depreciation of our track. Further application of alloy steels and other high-grade materials in car construction should bring still further weight reductions. However, a great reduction in the unsprung weight on present and future cars would be a boon to us maintenance of way men. The rigid rolling load over the rails is what causes us so much grief on both plain track and special trackwork construction.

In Omaha a little less than one-half of our present motor and truck weights is unsprung load. This, in our 900 type cars, is equivalent to a rigid load of 5,600 lb. per truck, or 11,200 lb. per car. In other words, about 27 per cent of the total dead weight of our older types of electric cars for city service is unsprung weight. In some of our two-motor equipment, this percentage is reduced to about 19 per cent. The ideal condition for a rolling load, in order to have the least destructive effect on the support, whether track or pavement, is to have it entirely supported by either springs or rubber. On the other hand the most destructive and damaging rolling loads, and the most noisy, are those which are carried on the rail with no spring support.

Much of the noise from rolling load operation is created from impact, or lack of flexibility. In order to reduce noise, and realize the most life from our track and special work, we should operate the lightest, the most flexible and resiliently supported cars possible. This would also add to the life of the car itself, particularly to the lighter bodies. We should get every pound of weight possible on good shock-absorbing springs.

You can rest a 2,000-lb. pile-driver hammer carefully on a concrete slab with no ill effect. However, if you pick the hammer up several inches and drop it on the concrete slab a number of times, you will break the slab. Pick it up likewise and drop it the same number of times on a properly designed spring bed above the concrete, and the effect of your blow is dissipated in the springs and not in the rigid concrete slab. The resulting effect on the slab of concrete will be only a small fraction of that produced by the rigid hammer blow. Rolling loads are an everyday application of such effects, which apply equally to the life of track or to paved roads. Surely great improvements can be made in equipment design which will eventually have the effect of greatly prolonging the life of the track, to say nothing of the other advantages to be obtained.

It is probably true that over 95 per cent of the wear and tear on track and special work is due to dead load weights only. Certainly and without question, great savings in maintenance of way can be made by reducing the work the track and special work must perform, by reducing these dead loads.

Such improvement in equipment would greatly prolong the service life of track, and consequently, permanent materials, so far as practicable, should be incorporated in the construction in order to resist depreciation through decay, etc. An extremely important element to be considered from this standpoint is the track tie. Long-lived tie support is the real objective in modern main line track design, whether paved or open construction. This may be obtained in several ways. Thirteen years ago our company used a batch of creosoted red oak ties in open track—treated with 2½ gal. of oil to the tie, of a commercial grade of creosoted oil perhaps 20 per cent raw tar adulteration. These ties are all in the track and will easily last twenty years. You can cut your average tie costs 30 per cent per year, through the use of a properly treated tie. This conclusion is gathered from our experience, and is based on an open track life of ten years for white oak, and includes 6 per cent compound interest on first cost in each case, over the periods of life.

The use of treated ties in paved track, particularly in a plain ballasted type, is also good insurance against what I have called depreciation through decay. Our oldest track of plain ballasted construction where treated ties were used is now twelve years old and in excellent shape. The ties, including the sapwood, are in almost perfect condition, as we have discovered from service pipe excavations, and from some joint repair work. This section furnishes from one to two-minute service during rush hours, cars weighing about 20 tons. Rail renewal will be easily accomplished on this section later on, through the use of tie plates and screw spikes.

Our experience has seemed to indicate that successful plain ballasted track construction in paved streets should include the use of well treated ties to insure against sapwood decay. Even though the heart wood of your tie remains sound, a spongy condition of the track will result if your sapwood deteriorates. In many paved streets where good sub-drainage exists, and where the soil is considered good for bearing, expensive ballast should not be necessary, providing there is a good tie under the track. There will be sufficient bearing support, particularly if lighter weight equipment is operated. Machine tamping has given us an improved method of compacting the materials under the tie. With a good concrete paving base, a successful track will result—even with just a thin blanket of surfacing material under the ties. The permanency of the tie is the basic foundation factor in track construction.

Reduction in track and roadway costs to the car rider should be further made by obtaining relief from paving costs. Many arguments pro and con have been made on the subject. We have found throughout the business district of our city that almost all the vehicular traffic is required to pass over the portion of the street paving paid for by our car riders. By actual traffic counts we found that practically every vehicle necessarily must drive on the tracks due to the parking system in vogue, as a result of which about 27 per cent of the street space is used for parking automobiles, while the street cars occupy only about 1½ per cent during the rush hours. It is manifestly unfair to the car rider to require him to pay interest on the investment in this pavement and also to provide a replacement fund to perpetuate it. Cheap transportation is so vital to the interests of any city, that this unfair burden should be removed from the car riders, as it certainly does not belong there today.

Many suggestions have been made as to plans for obtaining such relief. The main argument against assessing the track paving direct to the property owners is that in many cases, streets were paved wider, by reason of the fact that the railway was located therein. Again it is said that costs per square yard are slightly greater by reason of the fact that the lines exist in the street, and that our cars damage the pavement, etc.

On almost all types of city track construction, the railway must concrete its track to hold it in place—pending the arrival of the street paving contractor. This concrete is usually part of the paving support, and must be paved by the railway company when the track is built. In monolithic steel tie track, the concrete is both paving base and track support. The practicable way, no matter how the funds are raised, or where they come from, would be for the city engineering department to allow the same amount per square yard to the railway, for paving its space, as it allows the contractor for paving the sides of the street per square yard. Of course the construction of the railway paving, like the balance of the street, would be under strict supervision of the city engineers. The railway could in such cases pave with any good adaptable type of paving to be approved by the city engineer, in connection with the trackwork, as the railway might desire to use concrete, brick block, or granite, if there were asphalt paving proposed on the street. By this system the car rider would be required to pay the fixed charges on the difference in cost of the two paving types.

The trend of track costs has been downward since 1920, and I believe the downward trend in unit costs will continue gradually. Since the peak of 1920 we have realized an average yearly decline in unit track costs of about 3 per cent per year, although most of this decline took place in two years. Further alterations in types of construction should net additional savings in our investment costs. We should be extremely cautious, under present day conditions, in our expenditures on track, and feel our way carefully. The development of the private conveyance, and need for retrenchment outlines to us a different problem, and it may be that certain of our installations, such as outlying tracks in sparsely settled locations, may be abandoned. We cannot spend the money, at present costs, to rebuild and pave tracks over which very infrequent car service is being operated.

New Englanders Discuss Car Painting and A.E.R.A. Co-operative Committee Work

CAR PAINTING practice and a discussion of co-operative committee work in the American Electric Railway Association featured the New England Street Railway Club's May meeting, which was held on the afternoon and evening of the 28th at the Copley Plaza Hotel, Boston, Mass. Striking gains in shop efficiency were set forth during the afternoon session in a paper on "Modernizing Car Painting Practice," by H. T. Hurlock, engineer of equipment Eastern Massachusetts Street Railway, Boston. This paper will be published in an early issue of the ELECTRIC RAILWAY JOURNAL. Mr. Hurlock pointed out that by improved methods the number of revenue cars painted annually on his system has been increased from 34 per cent of the total cars operated in 1920 to 82 per cent in 1925, and that the man-hours required for painting a 40-ft. double-truck car have been cut from 340 in 1920 with hand labor to 90.9 in 1925 with spray and hand labor. An extended economic study of the subject formed an important part of this paper.

H. G. Noble, superintendent Everett shops, Boston Elevated Railway, read a paper on "Car Painting." This was followed by one on "Car Cleaning" by O. B. Johnson, inspector of car cleaning for the same company, which is abstracted elsewhere in this issue. Mr. Noble's paper will appear in a later issue.

In the discussion of the papers J. B. Crawford, Concord, N. H., stated that the Concord Electric Railway is changing the color of its cars from olive green to the orange used by the Boston Elevated and that two coats of body color and one coat of enamel are being applied. G. E. Pellissier, Holyoke Street Railway, emphasized the psychological impression that well-painted cars make upon the public from the standpoint of stimulating patronage and of accident reduction. In Holyoke a so-called "Non-Olio" liquid wax preparation purchased in California is used successfully to prevent dust and dirt sticking to the paint. No water is required, and the preparation has a preservative effect on the paint.

H. H. Hanson, manager Middlesex & Boston Street Railway, Newtonville, Mass., said that his company adheres mainly to the brush method of applying paint. It has lately been experimenting with lacquer, but finds that the time required to put on paint by the manufacturers' method and the loss of material incurred cost as much as the brush method. The company has used two colors on cars for the past five years, yellow enamel and bright red. This has given much satisfaction from the standpoint of visibility and selection of cars for territorial patronage, the difference in colors being most helpful to the traveling public. Both colors contribute to accident prevention.

W. C. Bolt, superintendent rolling stock and shops, Eastern Massachusetts Street Railway, briefly discussed open-air storage of cars in reply to an inquiry of G. C. Hecker of the American Electric Railway Association as to the advisability of such storage from the viewpoint of paint preservation. Mr. Bolt said that where a car is operated sixteen to eighteen hours a day it is of relatively small importance whether storage under cover is provided for the remaining hours. The cost of repainting is now comparatively small, and should be balanced in a practical case against the total cost of maintaining storage facilities, in order to decide upon the best policy. Frank A. Barbey, Boston, pointed out that the steam roads have gone through the problem of open-air versus covered storage and that little or no difference in cost has been discovered in favor of providing coverage.

H. E. Potter, Union Street Railway, New Bedford, Mass., said that on their road every car is cleaned nightly, car sweepers covering eight cars per night each. Every month a thorough cleaning is done. Rattan seats are effectively cleaned by a mixture composed of 2 gal. water, 4 oz. lye and 1 pint chloride of lime applied with an old water brush. After the seats are scrubbed and rinsed with water they are dried by turning on the electric heaters. The polish is brought back by the use of Old English wax and the luster is regained by rubbing with a woolen cloth. When interurban special cars are rented the seats are covered with canvas, which adds to their appearance, and the laundering cost is less than $1 per car.

CO-OPERATIVE COMMITTEE WORK OUTLINED

With the exception of an address upon "Business at Bat" by the Rev. Henry H. Crane, Malden, Mass., the evening session was devoted to talks upon the work of the co-operative committee on progress of the A.E.R.A. C. G. Hecker, New York, described this development and pointed out that 55 men constitute the national committee membership on management and co-operation and, with Mr. Wilde, spoke briefly of the general plan of intensive visits to operating properties to secure information on modern practice that will be incorporated in a handbook. All committees are asked to find out the extent to which properties visited are making use of association facilities as well as to discover good practices worthy of being passed on to the industry. Mr. Hecker closed with an account of the Grand Rapids car selection problem, referred in many details to the local public for help in determination from the angle of riding convenience.

F. B. Walker, chief engineer maintenance of way Eastern Massachusetts Street Railway, Boston, summarized the plans of the committee, and A. L. Hodges, Brooklyn City Railway, recounted various progressive practices of that company as a sample of the class of material the committees will seek in their field work.

Safety Practices in Brooklyn*

BY A. L. HODGES

Assistant Secretary Brooklyn City Railroad

WE BELIEVE the work conducted by our Employees' Safety Bureau in Brooklyn is of interest. This work is under the direction of a supervisor of safety and an assistant who meet regularly with 30 safety committees at the various shops and depots. Their activity has resulted in an increase of 67 per cent in the number of shops with 100 per cent safety records in the course of six months.

A butterfly type seat is used in the vestibules and across center exit doorways of the new type cars. When not in use the seat is folded like a book and dropped into a pocket. This design was brought about by requests from passengers to do away with the old-style seat which is hooked up or latched when not in use. Trainmen do not always get the legs under them properly, causing them to give way with passengers' weight.

The 335 new cars are designed so that all wiring is carried through the pier posts and behind the advertising card space by the use of special pressed-steel conduits and conduit fittings. The moldings and panels are made in sections so as to be removed easily.

This arrangement simplifies the wiring arrangement and makes for greater accessibility in repair work. It also eliminates the chances for short circuits due to water, etc., when such wiring is carried under the car floor.

These 335 cars are equipped also with a detachable or "demountable" vestibule. These vestibles have double hood plate construction, the lower or sub hood plate extends from the vestible corner post to vestible corner post and is securely bolted to upper or main hood plate.

The vestible corner posts are in two pieces securely bolted. The forward part of each corner post and the two center vestible posts are tenoned into the sub hood plate and the rear parts of the corner posts into the main hood plate. Pocket castings are bolted to the crown piece into which the bottoms of the vestibule posts are fitted. All bolts are made readily accessible with the removal of a minimum amount of inside finish. These vestibules have been set on a car and completely wired and fitted in one hour and 30 minutes.

---

*Abstract of address before New England Street Railway Club, Boston, Mass., May 28, 1925.

A very great majority of our accidents are what are known as vestibule accidents, i.e., car collisions and car and vehicle collisions, front and rear end. The use of detachable vestibules permits a damaged car to be returned to service in a few hours instead of several days or weeks, depending, of course, on shop congestion, which is a serious question with us, all due to increased traffic conditions.

All of our schedules are plotted graphically before they are given over to the operating division. This enables us to correct errors in running time and to reduce the layover time at ends of line to a minimum.

By 9:30 o'clock each morning we have on our general manager's desk a graphic chart for each of the 68 individual lines comprising the Brooklyn surface system showing the receipts and time-table costs for the preceding day from midnight to midnight. This information is compiled by the night dispatcher at the surface depot and phoned to the transportation department dispatcher located in the main office building.

A set of such daily graphs for any given line over a period of months or years gives a very conclusive picture or prospectus of future traffic requirements.

Cross-section checks form another method used by us in establishing adequate service and proper distribution of short-line service and have proved a very successful method of arguing cases before legislative committees and regulatory bodies when attempts are made to compel the companies to extend their short-line service. These are made by taking checks simultaneously at various points along the line and establishing a 100 per cent loading point as well as the relative dropping off in riding to and from this 100 per cent point, and our schedules are then established to fit the needs as shown by such checks. The checks are made every 90 days or oftener if marked increases or decreases in daily riding, as shown by the daily receipt graphs, are noted.

In January we started an accident elimination contest by conducting meetings at our twelve surface depots. These meetings were addressed by our general manager, superintendent of surface transportation and the division superintendent.

It was pointed out to the men in graphic form just how the accidents of each type, on each line, were increasing, and also just what portion of each dollar in receipts was spent to pay for accident and injury claims. These pictures gave a comparison with the accidents of 1923 and 1924 and brought home vividly to each man the fact that more careful operation of his own car and anticipating the moves of the other fellow were essential to the reduction of accidents.

There were a total of 2,898 accidents on the Brooklyn Surface Lines in January, 2,197 in February, 1,958 in March and 2,212 in April, and these figures in themselves bespeak the value of the personal contact established at these meetings. In the matter of money expended the result has been most gratifying.

No reward has as yet been offered the men in this contest. The twelve depots are placed on a competitive basis, and each month a large card showing the standing is printed and distributed. The incentive thus established, to place their depot in first place on this graph, has been remarkable.

Car Cleaning Methods of Boston Elevated*

By O. B. Johnson

Inspector of Car Cleaning Boston Elevated Railway, Boston, Mass.

OFFICIALS of the Boston Elevated believe that car cleaning is essential to good repair and the keeping of the painted surface in good condition. The interiors of cars are cleaned daily. The floors, platforms and steps are sprinkled with disinfectant and the dirt from under seats, car sills and around fixtures is brought out where it can be reached with a broom or hand brush. This is then swept out with an ordinary broom. The interior of the car body and vestibule below the roof is dusted with an absorbent mop, with the exception of lamps, hand straps and window sills, which are wiped with a dry cloth.

Periodical cleaning is carried out once a month. At these times the entire interior finish of the car is washed with soap and water. Interior glass is cleaned at the same time and hand straps are disinfected by dipping in a jar of disinfectant. Upholstered cushions are cleaned by beating and curtains by wiping or brushing.

After every storm and at other times when necessary, the exterior of the car is washed all over below the roof. The team for exterior washing consists of a hose man and two brush men to rub. The hose man rinses after the rubbing. In this work it has been found necessary for the brush men to follow the hose closely, for if the surface has a chance to dry off the rubbing is less effective. When storage or other conditions prevent the use of the three-man washing team, a bucket and brush are used by a single man.

The painted exterior, together with signs, is washed with water and oil soap, using a sponge and brushes. Hunter signs, monitor and ventilator glass are cleaned once a month, by using soap, water, sponge and dry cloth. The outside of sign glasses requires more frequent cleaning during bad weather.

---

*Abstract of address before New England Street Railway Club, Boston, Mass., May 28, 1925.

Bus Regulation Arouses Lively Interest at Chicago

Control by I. C. C. of Interstate Operation Advocated at Mid-West Motor Transport Conference—Co-operation Will Prevent Needless Multiplication of Commissions—Economics of Bus Operation Discussed

UNDER the auspices of the National Automobile Chamber of Commerce, 200 representatives of the electric and steam railroads, the automotive and allied interests discussed transportation problems at the Mid-West Motor Transport Conference, Chicago, May 27 and 28. Keen interest was displayed in the subject of bus regulation.

Vesting power of regulation over interstate motor bus and truck operation in the Interstate Commerce Commission, which could redelegate that power to local agencies, was advocated by W. E. Dickinson, legal counsel Chicago, Rock Island & Pacific Railroad. The paper read was one which had been prepared by M. L. Bell, vice-president of the same company. Mr. Dickinson said in part:

"In view of the recent decisions of the Supreme Court holding that a state is without power to grant or withhold a certificate of convenience and necessity for the operation of a purely interstate highway carrier, it is probable that the next session of Congress will take some kind of action relative to this matter.

"Although overburdened with duties, isn't it better to intrust this regulation to the Interstate Commerce Commission than to create a new body whose views and duties and authority will perhaps conflict with those of the commission? As motor carrier problems are largely local, agents could be chosen to act for the Interstate Commerce Commission. Powers granted should be general, not too specific."

Mr. Dickinson was followed by Charles W. Chase, vice-president Chicago, Lake Shore & South Bend Railway, and president Gary Street Railway. An abstract of his address, "The Electric Railway and Highway Transport," will be found elsewhere in this issue.

Another speaker on the subject of regulation by the Interstate Commerce Commission was T. R. Dahl, vice-president the White Company. The position taken by Mr. Dahl was brought out in a paper he gave on "Is Regulation of Interstate Common Carriers Necessary?" This paper, which developed rather extended discussion, reviewed the action taken at meetings in Washington the week previous and urged congressional action giving limited powers to the Interstate Commerce Commission. The directors of the N.A.C.C., according to Mr. Dahl, would have the I.C.C. grant formal approval of certificates of public convenience and necessity. In case of disputes between the states the commission would act as a board of arbitration, but all other regulatory powers would be delegated to the state utility commissioners of the states where the operations were located. This solution, he believed, would overcome constitutional objections and still place control of essentially local operations in the state commissions.

The general counsel of the Chicago, North Shore & Milwaukee Railroad, Ralph Bradley, favored the legislation suggested by Mr. Dahl. Federal legislation should not require the payment of any fees to the federal government for investigation or for certifying operating rights, Mr. Bradley insisted. All taxation of the motor vehicles used by the carriers should be left to the states. Bus regulation is essential, he said. Otherwise there will be an absence of system and of regular schedules. Service will be duplicated, highways unnecessarily congested and fly-by-night operators will multiply. Unless rates are regulated, the industry will be in chaos, he held.

Speaking against the plan to have the I.C.C. give merely formal approval to certificates issued by the state commissions was Judge S. T. Bledsoe, general counsel Atchison, Topeka & Santa Fé Railroad. This plan, he said, would give no regulation at all. Congress cannot constitutionally delegate the power of regulating interstate commerce to the states. Once certificates are issued under such a plan it would be impossible to get adequate service or to regulate rates. The real test of regulation was, he declared, "Does the public interest require it?" This involves the present railroad carriers and their ability to perform a satisfactory service.

The motor bus, the motor truck, the railroads are all common carriers, he held, and as such should be regulated. There is no reason for intrastate regulation and not interstate regulation. It would not be necessary for motor applicants to go to Washington for hearings. The I.C.C. could designate state commissions as its agents to hear cases, or could send examiners to take the evidence. At present the states have power to regulate with regard to adequacy of service. This is as it should be, Judge Bledsoe pointed out. But when it comes to interstate rates, the states do not have jurisdiction.

The Field of the Motor Bus and Its Economics

In the motor bus session two subjects were taken up—"The Field of the Motor Bus" and "Economics of Motor Bus Operation." John A. Ritchie, president Chicago Motor Coach Company, was the principal speaker on the first subject. He said in part:

"Co-ordination is economically inevitable. The most noteworthy step in that direction was taken when the Interstate Commerce Commission was formed in 1887. Whatever its errors may have been, and however much and however reasonably its acts may have been criticised, there is probably no railroad executive of importance today who fails to see the value of co-ordination in such measure as the Interstate Commerce Commission has been able to effect.

"The establishment of state public utility commissions is another step in the same direction. But these are all governmental agencies and one cannot but feel that if we could voluntarily and effectively co-ordinate the efforts of our own national transportation organizations it would be far better than to see more public commissions established.

Multiplication of Commissions

"Already the number of commissions having certain powers over public transportation is legion. Already their decisions, not infrequently at cross-purposes, have mounted into many volumes, and added to the expense and embarrassment of trying to find out the way of legal safety in any proposed action.

"Would it not be the part of wisdom to anticipate further regulation and adjust the differences of opinion and interest among ourselves rather than be forced by public pressure to adjust them in ways which might not be either agreeable to us or to the most useful ends of society as a whole?"

One Speaker Defends Competition in Transportation

S. C. Hadden, Indiana Highway and Motor Association, Indianapolis, conveyed the impression that he believed in competition in transportation, although he said that he would be for co-ordination, when defined "as the greatest economical use of all transportation facilities." However, he would not agree that operation paralleling railway lines should be prevented. The final arbiter, the public, wants competition in transportation, he maintained.

In Minnesota, according to E. F. Zelle, president Minnesota Motor Bus Association, a plan of co-ordination of bus lines was inaugurated with the formation of the association some few years ago. With from 85 to 90 per cent of the bus operators of the state now in the association, respect is given to the other fellow's routes. Mr. Zelle said that equipment used was valued at $5,500,000, that the routes covered 8,600 miles.

H. B. Stowe, superintendent of automotive equipment Department of Street Railways, Detroit, told of the manner in which buses were being operated in connection with the trolleys there. The department is not making away with the old form of transportation but is taking advantage of the new. It does not believe that the bus manufacturers are trying to force the railways to use something they do not want. Continuing he said:

"Since its inception, the D.S.R. has been studying the traffic and transportation problems of Detroit. We have considered many units and devices for co-ordinated transportation, such as the trackless trolley, the motor bus, and subway dips for the downtown business section. The rapid advances in the design of the motor bus brought about its adoption by the D.S.R. as one of the units of its co-ordinated system. In July, 1924, we began our first motor coach operation on Belle Isle. Later in the year we purchased 50 single-deck coaches of the 21-passenger type, to be used as feeders to the street car lines, giving much needed extensions to the outlying sections of the city, which had no means of transportation. A subsidy plan is now being worked out in detail to insure the department against losses through the operation of these extensions. This form of subsidy represents a guarantee to the Department of Street Railways to assume losses that may be incurred beyond the cost of operation in some of these extensions, and that reimbursement to the department shall be guaranteed by interested business associations in the several districts into which the lines are extended. To date we have received several checks from the Delray Business Men's Association to cover the operating deficit of that particular extension.

The subject of economics of motor bus operation, as it applies to bus operations in and around Milwaukee by the Wisconsin Motor Bus Lines, was covered in a paper by H. A. Mullett, assistant general manager the Milwaukee Electric Railway & Light Company.

Mr. Mullett said that his company now had storage space for 600,000 gal. of gasoline. By purchasing when the market is right a considerable saving in operating costs could be made, he averred. It was his experience that accidents in connection with bus operation were less than with the trolleys. He advised operators to adhere to as few standards of equipment as necessary, to care for the different kinds of traffic.

Several speakers discussed the subject of economics of operation. J. M. Pogue, Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, told of his bus operation between Dayton and Columbus. It was started with seven-passenger touring cars and has since developed into a substantial service using 22-passenger sedan type vehicles, with a seat for every passenger. On week days the load factor runs between 55 and 60 per cent. On Saturdays and holidays it varies from 85 to 90 per cent, and some trips have to be double-headed.

One of the significant facts, he declared, is that the combined passenger traffic on both railway and bus exceeds that previously carried by the railway alone. It is believed that some of the private automobile traffic is being secured. Fares are based on 3 cents per mile, with a minimum charge of 25 cents, and it is a surprise, Mr. Pogue said, to see how many minimum fares are picked up.

One of the biggest economies in bus operation, said B. W. Arnold, superintendent of bus service Chicago, North Shore & Milwaukee Railroad, is to acquaint the public with the costs of operation. Legislators now think that the one "gold mine" left is the bus. Two bills are now before the Wisconsin Legislature dealing with the buses, one would require a certificate of convenience and necessity for operation, and the other would increase taxes 25 per cent.

One strange thing about the regulatory bill is that the independent operators who four years ago so strenuously opposed the passage of such a bill now are the strongest for it. The reason for this is that since the passage of a similar bill in Minnesota some 38 operators have come into Wisconsin and started operation, often in competition with other motor carriers. These carriers now are among the strongest boosters for the bill.

Suburban operation of buses in co-ordinated service with electric railway cars was discussed by Bert Collett, general manager Chicago & West Towns Railway. This bus service connects the small western communities by north-side routes and eliminates roundabout riding on the company's cars.

The conference was honored by the presence of the Hon. W. M. Jardine, United States Secretary of Agriculture. In an address dealing partly with the work of his department and also with the influx of motor vehicles in this country, Secretary Jardine advocated the co-ordination of railroad, waterway and highway transportation. The purpose should be, he said, to develop each form to its highest point of usefulness without taking from another the functions which the other could perform to the better advantage of the public. We may help the motor vehicle to find its place by wise restraint of its more enthusiastic proponents and by refraining from regulation which may have a crippling effect. Traffic surveys made by the department in six widely separated states show there is no basis for the belief that the motor truck will compete seriously with the railroads, according to Secretary Jardine. The truck has found its place in the short haul and is not taking over any business that the railroads can do as well or better.

Sweeping changes in the way that the public will travel, and the revolution in the method of shipping goods were predicted by A. J. Brosseau, president Mack Trucks, Inc., in discussing the relation of highway transport to other transportation agencies at the opening session, Wednesday, May 27. Private passenger cars, motor buses and motor trucks serve not alone the public but the other and older transportation agencies as well, he declared. How to employ these instruments to the best advantage of all is the task which confronts operators.

Significance of Subsidized Bus Competition*

By Charles W. Chase

Vice-President Chicago, Lake Shore & South Bend Railway, and President Gary Street Railway

THE main problem of the electric railways is to provide transportation for the people during some four hours of the day. The electric railways carry some 44,000,000 passengers per day and at least 20,000,000 must be taken to their destinations in four hours or at the rate of about 5,000,000 per hour. This is the real problem of the electric railways and I am convinced that there is no way of handling it except through the use of rapid transit trains, either elevated or subway, and large capacity surface cars.

The place of the bus, therefore, is not in competition with electric cars in carrying the rush-hour crowds. It seems to me it is in extending needed transportation service into territory where the home development is not sufficient to warrant the laying of rails and the stringing of wires. The bus also fits in supplying service to residential sections that do not now have rail service and which may not want noisy street cars operated on their streets.

The gravest menace to the street railway today is the highly subsidized motor bus competition, well organized and aided by abundant capital. Such a venture carries little risk and a good chance of quick profits. If the street railway of a community be unfortunate enough to have encouraged the displeasure of the political administration, it is a simple matter for persons, even unknown and untried in the transportation industry, to acquire a competing franchise. Then there are motor bus manufacturers who will advance against this franchise practically all of the capital necessary in the shape of buses. They will organize and supervise the business. The enterprise will start, planting its service along profitable routes of the street railway, preceding that service by sufficient time to secure the patronage and leave the railway to do the drudgery of all the unprofitable and pioneering service which the development of the community may require. In all, an economic waste and sheer duplication of service.

An instance, not far from Chicago, exhibits the strange spectacle of a city granting a 25 year franchise to such a competing motor bus service covering all of its streets and prohibiting by regulatory ordinances all competition from other buses and jitneys and even operation by the street railway itself of any protective motor bus service. This bus company is permitted to charge a 10-cent fare while the street railway is damned because with an 8-cent cash and 7-cent ticket fare it will not spend hundreds of thousands of dollars for street improvements, producing not a nickel of return to itself. It is true that the franchise requires the payment of 3 per cent of the gross receipts of the bus business to the city, but this must be expended in the maintenance of the streets used by the motor buses —an insignificant consideration for use, otherwise free of charge, of the enormous investment of the public in its streets.

This highly subsidized business—subsidized both as to free use of the public property and greatly increased rate of fare—can only succeed when the political and public psychology of the situation presents a fertile field for such a venture. But too many such situations do exist in our cities or can be easily engendered. It behooves us of the street railway industry, therefore, to be vigilant to maintain to the best of our ability sound public relations—thereby protecting ourselves from such forays. Constant efforts to study and meet the public desires and needs as to transportation and a spirit of accommodation will accomplish this, as has been abundantly demonstrated in many cities; even in one contiguous to the city first mentioned and in which the street railway and the city have been working hand in hand for complete and unified street railway and motor bus service, with the buses serving as feeders to the street railway lines and doing the pioneering transportation work in the thinly settled suburbs and parts of the city.

Would it not be better and productive of greater and more lasting returns, I wish to ask the motor bus manufacturer, for him to encourage, aid and protect by co-operative effort the street railway in its desire to extend and modernize its service by the use of motor buses as feeders, and do the pioneering transportation work, than to aid or countenance the questionable efforts of irresponsible persons to profit by the misfortunes of a particular street railway and to deprive it of its business by instituting a competitive and highly subsidized system of transportation, which assuredly cannot be of lasting tenure of life and must present an unstable foundation for profitable business relations with the manufacturer of motor buses?

Bus Session at Automotive Meeting June 18

THE morning of the third day of the four-day session of the Society of Automotive Engineers at White Sulphur Springs, West Va., June 16 to 19, will be devoted to discussion of gasoline-electric buses and rail car design. On the morning of June 18 H. S. Baldwin, General Electric Company, will read a paper on "An Electric Drive for Gasoline Buses."

American Association News

Special Reports Available

THE following special reports have been prepared and are available to member companies in good standing upon request:

Bulletin No. 26. *Motor Bus Decisions.* A summary of court and commission decisions made under existing laws involving motor vehicle common carriers, both passenger and freight, covering such subjects as jurisdiction and powers of commission, issuance of certificates of convenience and necessity, abandonment, extension or modification of routes, service requirements, etc., preceded by an analytical index making possible ready access to decisions on all phases of motor vehicle operation.

Bulletin No. 27. *Traffic Ratios*—1924. *Part I. City Lines.* This is a tabulation of ratios and comparative unit figures derived from the operating reports of electric railways in 1924. The cities are grouped according to their size, and there is shown in each city the riding habit, the average speed, revenue passengers and car-miles per mile of track, per car operated, revenue per mile of track, operating ratio, passengers per car-mile, proportion of transfer passengers and operating income per mile of track.

Bulletin No. 28. *Traffic Ratios*—1924. *Part II, Interurban Lines.* A tabulation of data for interurban lines similar to that given in bulletin No. 27 for the city lines. For the interurban lines the data includes the average speed, revenue passengers per car-mile, per mile of track, per car operated, operating ratio, revenue per mile of track, and operating income per mile of track.

Bulletin No. 29. *Motor Bus Operations in the United States, Part V.* This is the fifth installment of a list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operators, and where the information is available, statistical data on the character of their operations. The present installment covers the states of Alabama and Oregon.

In addition to the above supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies, Bulletin No. 30, have also been prepared, bringing them down to date.

---

*Abstract of a paper presented at the Mid-West Motor Transport Conference, Chicago, May 27.

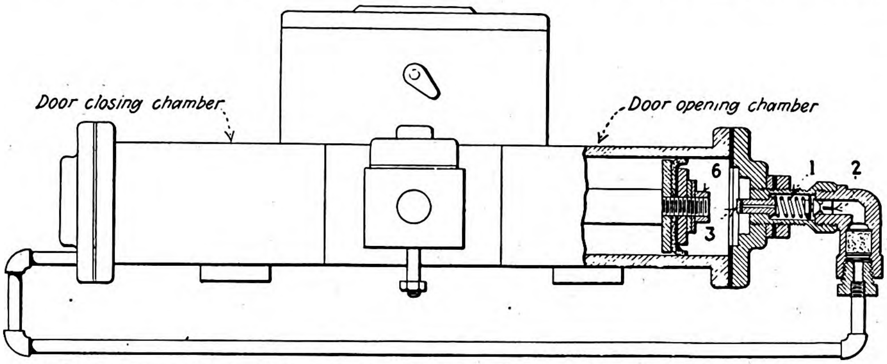
Maintenance of Equipment

By-Pass for Door Engines

When the closing movement of an air-operated door is stopped pressure builds up in the closing chamber in certain types of door engine, so that when the door is released it will slam. Should the door movement be interrupted through a passenger being caught, this increased pressure prevents withdrawal and may result in injury. To insure that the closing pressure will not become excessive, a by-pass safety valve is being installed on cars of the New York State Railways, which have air-operated doors with door engines. This arrangement was devised by H. S. Sweet, engineer of equipment for the railway.

In arranging door engines for use with the by-pass safety valve, a new head is installed on the door-engine opening chamber and the by-pass mechanism attached at this end with a pipe connection to the door-closing chamber. The device, together with the necessary piping, is shown in an accompanying illustration. With this attachment installed, if a person is caught between the jamb and the door while it is closing, pressure will build up in the door-closing side of the engine until it has reached the pressure for which the spring No. 1 has been set. On the New York State Railways this is about 35 lb. Any greater pressure will cause valve No. 2 to open against the spring pressure. Air from the door-closing side of the engine will then flow through valve 2 and port 3 into the door-opening cylinder, which is connected to atmosphere for the closing operation. The pressure of 35 lb. is small enough so that a person can readily be released as the door can be shoved back against this pressure easily. Also, after the movement of the door is allowed to continue, it closes at its normal speed, since excess pressure in the closing chamber does not result.

When the door has once closed, the mechanism also provides that full pressure on the door-closing cylinder is applied to prevent the door from being forced open. In closing, nut No. 6 on the piston presses against valve stem No. 3. This increases the tension of spring No. 1 sufficiently to prevent the door being forced open while in the closed position.

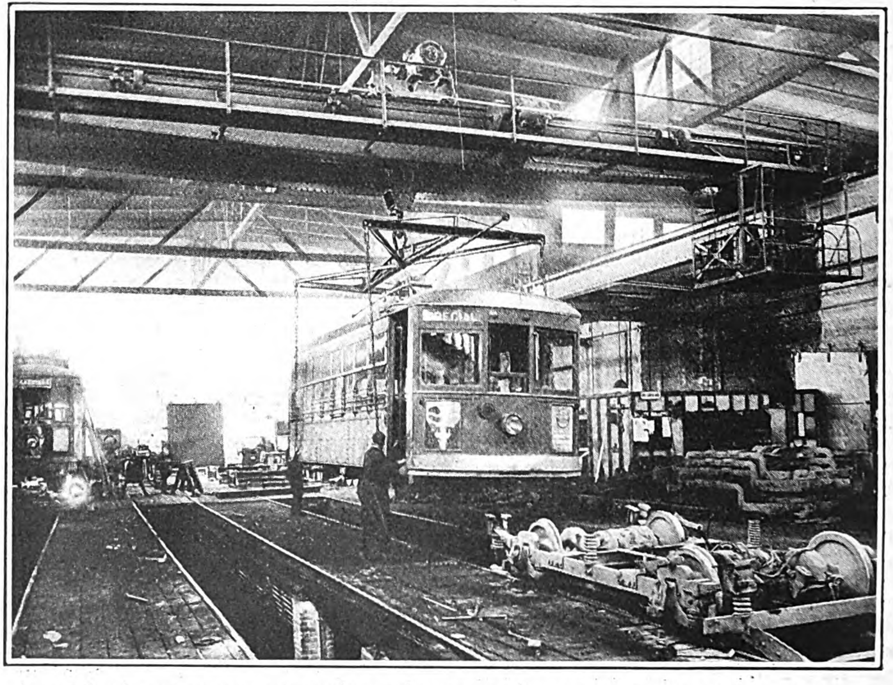


This By-Pass Safety Valve Used on Door Engines on New York State Railways Prevents Slamming

---

Sling Used to Raise Birney Car Body

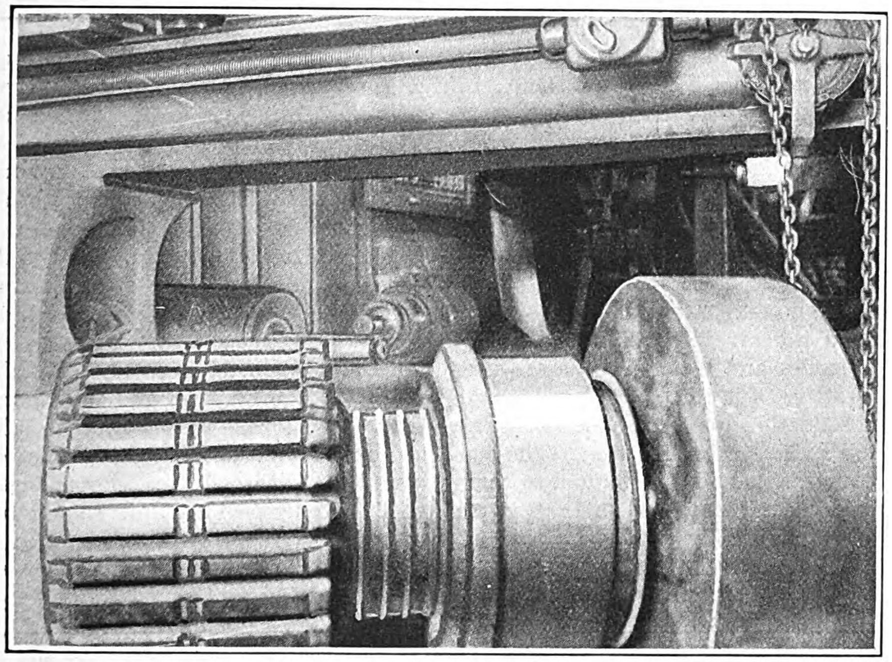
Lightweight safety car bodies are raised from their trucks in the Campello shops of the Eastern Massachusetts Street Railway, Brockton, Mass., by an arrangement of a sling and chains as shown in the accompanying illustration. A 5-in. T-rail is the central member of the framework of the sling. Diagonal members crossing at the center are 2¼-in.x3-in. angles. These are separated at their ends by 4¼-in.x2¾-in. angles. At the four corners of the sling are chains which pass under the car body. The shop is equipped with a Niles overhead traveling crane, which has ample capacity to raise the sling after it has been adjusted to a car body. In order to remove a car from its truck it is necessary only to attach the sling and pick it up with the crane. The truck can then be pushed out and the car body lowered onto supports.



Overhead Crane in the Campello Shop of the Eastern Massachusetts Street Railway Picks Up Light-Weight Car Bodies from Their Trucks

Installing Commutator Segments in Railway Shop

ON THE Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., it is the practice, whenever possible, to install new segments in worn commutators rather than to buy entirely new commutators or send them to manufacturers for repairs. It very often happens that most of the segments are in good condition and that only six or eight need replacement. New segments are purchased from the manufacturer and installed in the company's shop. How this has been done on the armature for a Westinghouse 510 motor is shown in an accompanying illustration. Six new segments are marked in white. To make repairs a couple of turns of wire are wrapped tightly around the commutator, after which it is removed carefully from the shaft and the new segments are installed at the bench. High segments are turned down in a lathe after the commutator has been reinstalled on the armature shaft. The winding is done in the spare time of a shop man when not occupied with other duties. It is thought by the management that this method has considerably reduced the cost of commutator repairs.



New Segments (Marked in White) Installed on Westinghouse No. 510 Armature Save Buying New Commutator

The following is an outline of a method recommended by the Westinghouse company for doing this class of work. The operations are given in the order in which they should be followed:

1. Fit the front metal V-ring over the metal bushing, or spider. It may be necessary to do some filing to obtain the proper clearance.
2. Fit the ring nut on the bushing. It may be necessary to clean out the threads on the bushing and nut to allow ring nut to be screwed up by hand.
3. With the front V-ring placed over the bushing and the ring nut screwed up tight, check the clearance of the front V-ring over the nut by lifting it up against the under side of the nut.
4. If it is a bolted type of commutator, the same procedure as indicated should be followed.
5. Dismantle the metal parts and scrape off all the paint and dirt. This applies especially to the V's.
6. Clean out the V's in the assembled copper segments, using fine sandpaper. Thoroughly blow out all dust and dirt and check for short circuits, using 500 volts between bars. After testing, brush the inside of the V's with a very thin coat of clean shellac.
7. Thoroughly clean the mica V rings, especially at the fit of the V, using fine sandpaper.
8. Assemble all parts and draw up ring nut as tight as possible while cold.
9. Cut off the temporary band wires holding the segments together, and further tighten up the ring nut.
10. Check for the alignment of the center line of commutator bar or mica (as given on commutator drawing) with respect to the center line of the keyway in the bushing.
11. Heat the commutator to a temperature of from 125 to 150 deg. C. and press while hot at from 20 to 30 tons, depending upon its size.
12. While hot and under pressure, further tighten up on the ring nut, after which remove the assembled commutator from the press to cool.
13. When cold, check for short circuits, using 500 volts between bars.
14. Check for grounds, using 4,000 volts alternating current if possible.
15. Press onto the armature spider, or shaft, and true up the face and neck.
16. After soldering, undercut the mica approximately 3/64 in. deep.

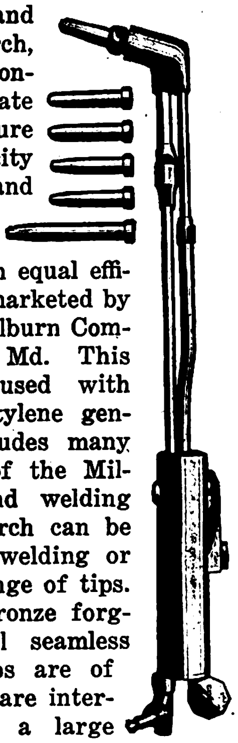
The following points should be considered:

1. Use a good reliable make of mica insulation. Some grades look good on the surface, but are built up with an inferior bond which allows the pieces of mica to squeeze out under pressure. With this grade of mica it is often impossible to use these parts again.
2. Tighten commutator under pressure while hot.
3. If an oven is not available, it is preferable to heat the commutator on the inside, using a gas ring.
4. In tightening the ring nut, use a wrench rather than a hammer and chisel, as these destroy the nut.
5. If for any reason the commutator segments have to be removed after the bands are cut, a three-part clamping ring can be used to hold them together.
6. Do not fail to keep the commutator undercut, 3/64 in. maximum; 1/64 in. minimum; the front V ring clean and well painted; the commutator free from oil; the rear of commutator sealed from dirt and moisture; the commutator tight; the face of commutator smooth; the neck full width; the mica extending 1/16 in. at rear, and segments free from grounds and short circuits.

New Equipment Available

Combination Low and High Pressure Torch

A CUTTING and welding torch, especially constructed to operate with low pressure acetylene gas, city gas or hydrogen and which will operate on high-pressure gas with equal efficiency, is being marketed by the Alexander Milburn Company, Baltimore, Md. This torch can be used with low-pressure acetylene generators and includes many standard parts of the Milburn cutting and welding torches. The torch can be used for either welding or cutting by a change of tips. It is made of bronze forgings and special seamless tubing. The tips are of solid copper and are interchangeable with a large number of low-pressure torches of other makes.



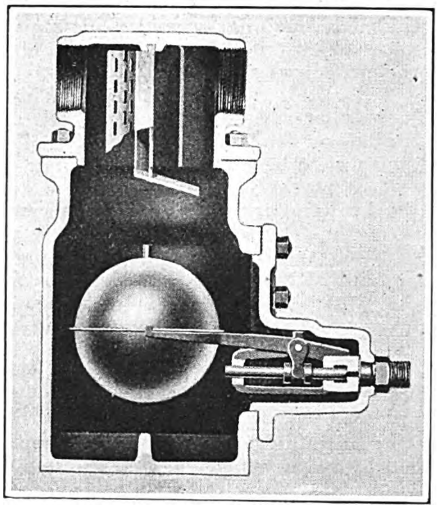
Starting Switch for Shop Motors

FOR controlling a.c. shop motors of not more than 10 hp., the Electric Controller & Manfacturing Company, Cleveland, Ohio, has placed on the market a push button operated starting switch. The contacts are oil-immersed and close the circuit directly across the line. The switch is arranged for wall mounting and is housed in a pressed-steel case with removable top cover. The contactor and overload mechanism is mounted on a slate base fastened to the case. The oil tank for immersing the main and overload contacts is suspended from the case by slotted spring clips. These permit the tank to be lowered part way for inspection and adjustment of the contacts. The operating coil is mounted on the core and is front-connected.

The new starting switch, called type ZO, has an expansion wire type of inverse time element overload device, used by the manufacturer on other starters. Current in the wires causes them to expand until a certain temperature is reached, when the contacts trip. If a momentary overload occurs, the wires begin to lengthen at once. If the overload goes off before the wires have lengthened enough to trip the contacts, they quickly return to their normal-load length. The overload device is adjustable. It is inserted during both starting and running. The time element characteristic makes it possible to protect the motor for the continuous running current and also for the higher current during acceleration. In case the motor does not start, due to abnormal load conditions or to the loss of one phase, the overload device will function so as to open the circuit in less than five seconds from the time the contacts are closed.

Removing Water from Air Lines

WATER in compressed air is a source of trouble in all electric railway shops. It cakes the sand and chokes the feed in sandblasting machines. It spoils air-brush painting. It slows down the operation of air-operated tools and causes rapid wear and rusting of parts. Water collects in pockets in piping and loosens pipe scale, rust and dirt from the inside of pipes, which form a further source of annoyance and trouble. In cold climates freezing results. To separate and discharge the water from air lines automatically, a device known as "Dri Air" has been placed on the market by the New Jersey Meter Company, Plainfield, N. J.



Valve for Separating and Automatically Discharging Water from Air Lines

This device is arranged for installation at any convenient point in the compressed air line and is recommended at inlets and outlets particularly. Separation of the water from the air is effected by the use of baffles and traps such as are used in steam separators. This includes a reduction in the velocity of air and a change in direction. The construction provides a channel to carry and direct the water so that it can be automatically removed.

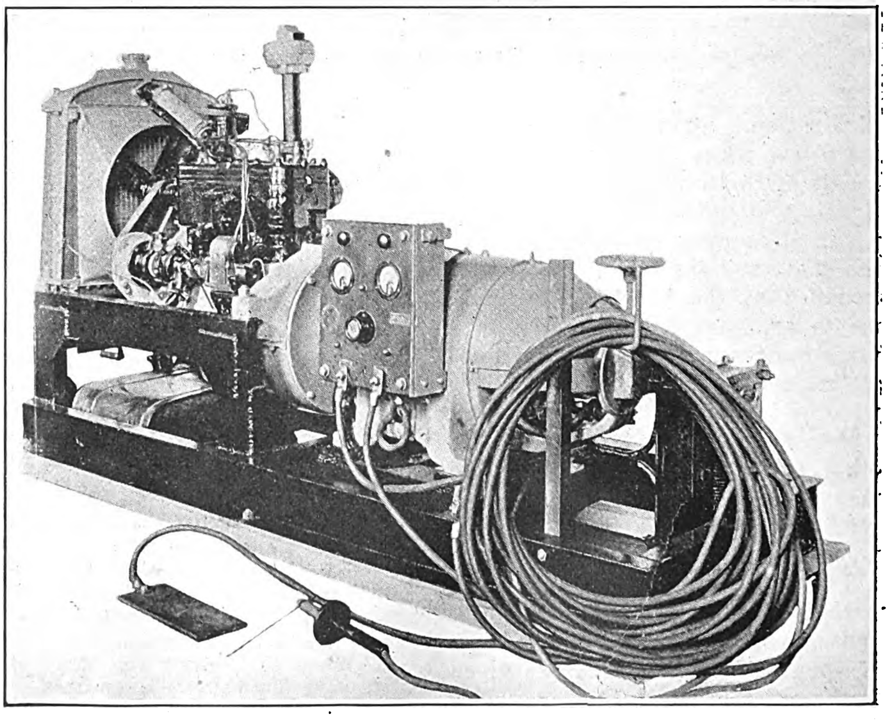
The device is drained by means of a float-operated valve as fast as the water collects. This eliminates the necessity of having a man go around at intervals to open drain valves. The separator and water trap are combined into one fitting. The discharge valve is operated by means of a self-baling and non-collapsible copper float. As the float does not need to withstand a high collapsing pressure, it is light and powerful enough to operate a valve with large openings and high lift, giving a large discharge capacity. Internal parts are of bronze or copper to eliminate corrosion. The discharge valve is so located as to guard it from grit and dirt.

Engine-Driven Welding Set

AN ENGINE-DRIVEN welding set which consists of a standard WD-12 welding generator driven by a Buda engine, all mounted on wooden skids to facilitate moving from place to place, has recently been added to the General Electric line.

The engine is a Buda model WTU, especially designed for heavy duty. It is a four-cylinder, four-cycle machine of "L"-head type, with 3¾-in. bore and 5⅛-in. stroke. The S.A.E. rating is 22.5 hp., and at 1,400 r.p.m. the actual brake-horsepower is 33.

The new outfit is being marketed complete with all accessories and ready for use. This unit should be of value in repair work and on any construction job where electric power is not readily available.



Welding Generator Driven by Gas Engine

The News of the Industry

Oakland Report Filed

Hearing on July 2 to Consider Suggestions Contained in Report of Engineers

Engineers have completed the traffic survey of the traction division of the Key System Transit Company, Oakland, Cal., and have filed their report. They recommend a comprehensive loop system and rerouting in the downtown section of Oakland designed to relieve existing congestion and speed up traffic.

A decrease in the number of stops between Oakland and other points in the East Bay has also been recommended, together with changes in equipment and the installation of a traffic bureau to continue the joint survey.

The survey was started in January, 1924, when the Key System Transit Company engaged the services of Richard Sachse, consulting engineer. On learning of this the city of Oakland asked permission to join in the survey. This request was readily granted. It was also suggested that the State Railroad Commission co-operate in this matter.

The commission was willing to do this, but to secure its official participation it was necessary to have the city of Oakland file a formal complaint citing the need of a joint survey.

Shortly after the survey started the company agreed to make any changes recommended without awaiting the completion of the task of the engineers. As a result new bus lines were installed in districts now without adequate transportation. Additional cross-town bus lines were also put into operation.

New Loops and downtown rerouting recommended by the engineers in their survey will mean the expenditure of about $85,000 for new construction and about $30,000 for reconstruction.

One hundred cars of the traction division were found to be unsatisfactory for rebuilding and the engineers recommended that 30 new cars be purchased immediately and that about 30 more be bought each year until the obsolete equipment is replaced.

It was further recommended that stops be spaced as nearly as practicable eight to the mile instead of about thirteen to the mile at present. Still further to speed up Berkeley-Oakland traffic it was recommended that Shattuck Avenue be used for semi-rapid transit service with a maximum of six stops to the mile between the main business sections of the two cities. A non-stop bus service was also suggested as an alternative plan. The surveyors, however, pointed out that the proposed revision in the number of stops will speed up service 20 per cent.

These recommendations were brought before the State Railroad Commission on May 28 for action.

The Oakland Chamber of Commerce announced that its engineers had not had sufficient time to study the report and requested an adjournment until July 2. This was granted by Commissioner Clyde L. Seavey.

After the contents of the survey had been made public President C. O. G. Miller of the Key System Transit Company said in part:

> As some people have misunderstood this situation and have consequently laid importance upon this investment of $85,000 new capital, we beg to mention that the annual report of the company for 1924 shows a total expenditure in roadbed and equipment exceeding $1,085,000 that year—the first of operation under the present administration.
>
> The committee has recommended the purchase of 100 new cars over a period of three years, 30 cars to be ordered upon the approval of the report. This will add approximately $450,000 to the company's capital expenditures during the coming year.
>
> The company expects to go forward with this despite totally inadequate returns on its investment, but in doing this it seeks the help and co-operation of all the communities it serves. The Railroad Commission has the report of the engineers under advisement and whatever recommendations contained in the report are approved by the commission will be put into effect as rapidly as possible following the granting of the necessary permits by the city of Oakland.

Five-Cent Fare Plan Scotched

Hylan's Transportation Board Finds Five-Cent Fare Plan for New Transit Lines Impossible Without Heavy Assessment Against Realty—Report Regarded as Robbing Mayor of Sole Issue in Coming Fight

In a lengthy report made public on May 29 the Board of Transportation of New York City warned the Board of Estimate that it will be impossible to finance the construction of Mayor Hylan's comprehensive municipal subway system and operate it on the basis of a 5-cent fare unless an assessment of approximately $325,445,000 is levied against private real estate in the city. The total cost of the subways is estimated at $542,915,000.

The Board of Transportation further stated that if Mayor Hylan and the Board of Estimate adopted this plan, which appeared to be the only feasible 5-cent fare plan available, the total of $325,445,000 should be so divided that $138,445,000 would be levied in direct assessments against the owners of real property in the areas benefited by the proposed subways and $187,000,000 would be levied against the real property of the city at large. The latter sum would be provided for in the budget and collected in the form of taxes over a period of eight years.

The actual route of the proposed Hylan subway system is 57 miles, with an actual trackage of 170 miles. This latter figure is the result of the total trackage for two-way and express service over the various routes.

TAXATION HARDSHIP LIKELY

The Transportation Board, consisting of John H. Delaney, chairman; Daniel L. Ryan and William A. DeFord, all of them appointees of Mayor Hylan, has based its report on the presumption that the entire Hylan subway system would be built. The board points out, in commenting on the assessment method of financing this system, that the alternative of financing the construction through bonds would be equivalent to operation of the lines at an 8-cent fare.

Furthermore, the report points out the almost utter impossibility of financing the new subways by 50-year bond issue because the borrowing capacity of the city will not permit it unless all other public improvements, including new schools, ordinarily financed by 50-year bonds, are completely abandoned during the next five years. This would result in a taxation pressure as early as 1928 more distressing than the present transit situation.

The law fixes a 5-cent fare for the first three years of operation and a self-supporting fare after that period.

To do this, the report points out, it will be necessary partly to finance the subway out of the budget and partly by property value assessments. Here is the case in a nutshell:

The estimated cost of construction and equipment of the proposed new subways, prior to beginning of operation, is $506,765,000.

All that the returns from a 5-cent fare could take care of in the way of paying interest and amortization on 50-year bonds, after paying operating costs and depreciation, would be $243,000,000, and any outstanding indebtedness in excess of that sum would have to be financed otherwise. It amounts to this:

The subways can take care of, on a 5-cent fare basis, an indebtedness of	$243,000,000
Leaving a balance to be handled otherwise of.......	263,765,000
This would be divided as follows:	
Out of taxation	110,000,000
By property assessments..	138,445,000

It would be necessary also to provide for about $77,000,000 additional expense for new equipment after the fourth year out of taxation, and to levy additional property assessments as required for expenses which are sure to arise.

Chairman Delaney insists that the short term serial bonds to be included in the budget would not increase taxation. They would be issued in series to be paid off in the next eight years.

As for the plan of levying assessments against properties benefited by the new subways, Chairman Delaney cannot see any objection to it. He points out that property owners have volunteered in some parts of the city to pay the entire cost of construction of subway lines abutting their holdings. The board has the power to assess any part of or all the cost of subways upon benefited property.

Experience has shown, according to the report, that financing the entire project by 50-year bonds would add about 15 per cent to the cost of construction. The following conclusion is reached after an exhaustive presentation of the proposition from all angles:

> The rate of fare for each passenger can be permanently maintained at 5 cents if all the capital required during the construction period in excess of $214,700,000 be provided by issuance of short term serial bonds and a moderate assessment on property directly benefited by the new lines. By this method of financing the interest charges during construction will be approximately $40,000,000 less than if the whole project is financed by issuance of 50-year bonds. When the interest charges are included the total investment under this plan would be $542,915,000.

The capital invested under each plan would be approximately as follows:

FIVE-CENT FARE PLAN	
Cost of construction and equipment for initial operation...	$506,765,000
Cost of money prior to initial operation	36,150,000
Capital investment at beginning of operation	$542,915,000
EIGHT-CENT FARE PLAN (FIFTY-YEAR BONDS)	
Cost of construction and equipment for initial operation...	$506,765,000
Cost of money prior to initial operation	76,015,000
Capital investment at beginning of operation	$582,780,000

The report says the capital with which to finance the construction and equipment of the new system in a manner that will permanently establish a 5-cent rate of fare can be obtained from the following sources:

Sale of fifty-year bonds.......	$214,470,000
Sale of serial bonds maturing in annual instalments during the next eight years	187,000,000
Assessment upon property benefited in the areas contiguous to the new lines....	138,445,000
Already provided in budget of 1925	3,000,000
Total capital necessary ..	$542,915,000

The report says this plan appears to be wholly practicable in its apportionments. The report is accompanied by a detailed exhibition of costs of construction and operation of twenty-seven different sections of the proposed lines embracing 170 miles of single track, of which five, extending up Central Park West from 64th Street and out into Washington Heights, have already been authorized by the Board of Estimate. Approval is asked for the twenty-two lines not already validated.

Chairman Delaney suggests that the city might save $25,000,000 original cost of a power plant and the interest on the investment by purchasing power from a contractor.

H. U. Wallace Succeeds Ross Schram

H. U. Wallace, general manager of the Knoxville Power & Light Company, Knoxville, Tenn., has been appointed general manager of the Department of Street Railways at Detroit, Mich., succeeding Ross Schram. Announcement to this effect was received by wire from Detroit at 5:30 p.m. on Friday, June 5, just as the issue of the ELECTRIC RAILWAY JOURNAL for June 6 was being put to press. The telegram contained no facts other than the statement of the change.

"Is Arbitration Arbitrable?" Question at Boston

The Boston Elevated Railway, Boston, Mass., and its union men are in flat disagreement. Recently, the company proposed a change in the existing method of arbitration by which the company has chosen one arbiter, the men another, and these two a third. The men rejected this proposal.

The public trustees in charge of the elevated have now made public a letter signed by James F. Jackson, chairman of the elevated trustees, in which it is stated that the trustees declined to acquiesce in the attitude of the union men. The trustees, in their statement, suggest that each party name its own representative and the selection of the third, or "neutral" member, be left to the Governor of the commonwealth. The company has already named Roland W. Boyden as its representative, and the men attorney James H. Vahey, on the assumption, their representatives say, that the two men thus named were to name the third, or "neutral" man, and the board consider only disputed questions on which they have not been able to agree in negotiation, but not the method of arbitration, as they assert they are perfectly satisfied with the method in operation between the parties for the last thirteen years. The parties for the last thirteen years.

Wages Reduced in Sioux City

Because of falling revenues, the Sioux City Service Company has announced a reduction in the wage scale of its employees of 6 cents an hour, effective June 1. This change reduces the pay of the majority of the men to 50 cents an hour from 56 cents an hour. First year men will receive 45 cents an hour, second year men 47 cents an hour and third year men 50 cents an hour. Overtime work will be paid for at the rate of time and a half. For classes of labor other than trainmen, a reduction of 6 cents an hour will be in effect. The men are demanding an increase of 6 cents an hour more. No further retrenchment was possible without impairing the service to the public.

Pay-as-You-Leave Experiment at Oakland

An experiment with the pay-as-you-leave system will be made by the Key System Transit Company on its College Avenue line, between Oakland and Berkeley, Cal., beginning June 10.

Under this plan passengers will board both front and rear doors of cars on outbound trips and leave by the rear door, paying their fares as they pass the fare box. On the inbound trips, from Berkeley toward Oakland, the regular pay-as-you-enter system will be used.

Twenty-Mile Road Makes Record

All the rolling stock owned by the Lehigh Traction Company, Hazleton, Pa., was in operation from early Saturday morning, May 30, until early Sunday morning. Not one failure was reported. All of the men reported for work and no delays took place.

Up to June 1 returns had not been completed, but indications were that 43,000 fares were collected, this including passes, transfers, metal tickets and cash. In other words, this 20-mile line was asked to carry 125 per cent more people on May 30 than it carries on any regular day in the year. Best of all, the feat was accomplished successfully.

Approximately 19,500 people visited Hazel Park.

Claims Desired Fare Will Meet Expenses

O. S. Johnson, vice-president of the Plattsburgh Traction Company, appeared before Public Service Commissioner Voorhis on May 27 in support of the company's petition for consent to increase the fare to 10 cents, with sale of three tokens for a quarter. He informed the commissioner that the Common Council of Plattsburgh had unanimously consented to the increase.

Mr. Johnson submitted figures to show the deficits encountered by the road in the last few years, while it was owned by the Delaware & Hudson Company. The company decided to abandon the property in March and it was bought by Messrs. Johnson and O'Brien to save it from being scrapped and to give the people of the city transportation. Mr. Johnson stated that with the proposed fare it was expected the road would about pay operating expenses, without any return on the investment. It is proposed that the 10-cent fare should apply to the entire line, but that tokens would be accepted within the city limits.

Portland Council Will Consider New Franchise

Franchises to run seven years under which the Portland Electric Power Company, Portland, Ore., will operate railway and bus lines to portions of the city not now served will be considered by the City Council shortly. The franchises have been completed after weeks of work on the part of John M. Mann, Commissioner of Public Utilities, and F. I. Fuller, vice-president of the electric company. Fares are to be fixed by the Public Service Commission.

The bus franchise provides that every bus shall have a capacity of at least fifteen persons and shall be operated at least every 30 minutes. Franchise fees for the bus lines will be $1 a seat a year and a flat annual fee of $10. Transfers must be provided between the bus lines and the railway lines and from the car lines to the bus lines.

Recent Bus Developments

Detroit Proposes Unusual Test—Union Street Railway Seeks Bus Monopoly—Experiment in Montreal—Activity Reflected in Other Cities

THE Union Street Railway, operating railway and bus lines at New Bedford, has bought the Interstate Bus Line and Providence Touring Company, which have been operating buses connecting New Bedford, Fall River and Providence. The railway is seeking to clear this field of bus competition and to have the rights of its own interstate bus line extended so as to do business between New Bedford and Fall River. It has filed a petition with the Massachusetts Public Utilities Department for authority to parallel its trolley line from New Bedford to Fall River with a bus line, so as to give the people a choice of service. H. H. Crapo, president, says that the people demand a bus service and if they cannot get it from the railway they will get it in some other way.

The petition is opposed by the Eastern Massachusetts Street Railway on the ground that the two railways have a joint operating agreement out of which the Eastern Massachusetts gets a sum of about $60,000 a year. Fred Cummings, vice-president of the Eastern Massachusetts, and Philip G. Carleton, attorney for the company, argue that if the Union is allowed to supplement the railway with a bus line it will cut down the service over the trolley line and to that extent impair the income of the Eastern Massachusetts, while all the profit from the bus line will go to the Union Street Railway.

President Crapo admits that the new move will hurt the Eastern Massachusetts financially, but replies that such fate is inevitable in the development of the bus.

The New Orleans Public Service, Inc., New Orleans, La., has added two more bus lines to serve as feeders to the railway in the thinly settled sections of the city. The Commission Council of New Orleans has given it a franchise to operate a bus line on Canal Boulevard between City Park and Taylor Avenues, a distance of eight-tenths of a mile, and also a franchise to operate a bus line for a distance of 2 miles in Gemtilly Avenue. The establishment of several other bus lines is in contemplation.

The first proposal of the People's Motor Bus Company of St. Louis, Mo., to co-ordinate its service with the cars of the United Railways was made at a meeting of the St. Louis Board of Public Service on May 26.

Richard W. Meade, president and general manager of the bus company, in opposing a permit to the St. Louis Bus Company, a subsidiary of the United Railways, to operate buses over DeBaliviere Avenue to the Municipal Theater in Forest Park, said that his company was willing to give the opera patrons who visit the theater during the twelve weeks beginning May 25 unified service by furnishing a transfer to the street cars on payment of a 10-cent fare, or to furnish service on the buses exclusively for 3 cents between the theater and DeBaliviere Avenue. The latter plan would enable street car patrons to ride on the cars for the customary 7-cent fare and then take a bus to the theater for an extra 3 cents. Mr. Meade contended that this plan would do away with such congestion as would undoubtedly be caused by competing buses and would give the public maximum service.

The Interstate Public Service Company started a parlor car bus service between Indianapolis and Louisville on May 20. This run parallels and supplements the service given by the same company with electric railway cars. It is made with a fleet of five Fageol parlor cars. Although the Interstate has operated buses between Indianapolis and Franklin and between Indianapolis and Seymour, and also between Scottsburg and Louisville, until now these routes were not connected. The new service is in addition to the local service. The fare is the same as on the railway, namely, $3.50, one way.

The Oklahoma Corporation Commission refused to grant an application for operation of a passenger bus line between Oklahoma City and Norman on May 12, holding that the present interurban service given by the Oklahoma Railway fully meets the demands of the public between these points. The commission also refused to grant application for a passenger motor bus certificate to operate from Oklahoma City to Cushing, holding that the service given by the Missouri, Kansas & Texas and Sante Fé railroads between these towns is sufficient.

Col. J. E. Hutcheson, vice-president and general manager of the Montreal Tramways, Montreal, Que., has announced that a supplementary bus service will be tried out in Montreal within the next three months. The Montreal Tramways Commission and the Montreal Tramways have been studying the subject for a long time. Colonel Hutcheson said that among the difficulties which the bus would encounter in Montreal were the narrow streets, steep grades, sharp curves and heavy precipitation of snow. The company is prepared to start tentatively a bus service from Sherbrooke Street west to Pine Avenue that will provide accommodation for those wishing to visit the hospital and for those who prefer a bus to a tramcar. The company is also giving consideration to the operation of a bus service between Verdun and the corner of Atwater and St. Catherine Streets as soon as the streets of this route are put in good condition.

Application for routes and rates has been filed with the Minnesota Railroad and Warehouse Commission, under the new state law, by the Mesaba Railway Coach Company of Virginia, Minn., and the Northland Transportation Company, Duluth. Incidentally a $250,000 deal is revealed by which the Mesaba company took over the routes of the Range Rapid Transit Company between Virginia and Eveleth, Eveleth and Leonidas and Aurora and Hibbing. The Northland bought the Rapid Transit Company routes from Duluth to Virginia and Virginia to International Falls, effective on June 1. The owners of the Mesaba company operate trolley cars along the Iron Range of the Mesaba Electric Railway and will adjust bus routes and cards so that the two services will alternate every half hour. The Range Rapid Transit Company is a pioneer in bus operation on the Mesaba range.

The Denver & Interurban, (Kite Route) Railroad, operating between Denver and Boulder, Colo., 30 miles, has asked for permission to operate a bus line between these cities and all intermediate points. The new service would compete with its own electric line and the Colorado & Southern Railroad, which owns the Kite. The Kite sets forth that its receipts are diminishing and that unless the loss is offset the railway cars may be taken out of service. Many applications from outsiders for the privilege of operating buses over this route, have been refused because of the fact that it would take too much revenue from the rail lines.

Detroit Proposes Unusual Test

AS A RESULT of a proposal by Ross Schram, general manager of the Department of Street Railways at Detroit, to the Mayor's Committee on Transportation the municipal electric railway and the Detroit Motorbus Company will cooperate in a test to discover how well motor buses can handle mass transportation. Mr. Schram has proposed that the department remove its cars from Woodward Avenue, which cuts the heart of the business district and has the Ford Highland Park plant at the other end, and that the Detroit Motorbus Company take all of its equipment for service on Woodward Avenue.

It is Mr. Schram's opinion there is no more beneficial clinic to be held in transportation than a test of this kind. Volumes and volumes are being written pro and con on "Motor Car vs. Trolley." Mr. Schram's own staff has given endless attention and thought to the matter. To him there seems to be no answer except actually to make the test.

This proposal has the approval of the Mayor's Transportation Committee, the Street Railway Commission, and the directors of the Detroit Motorbus Company. In this connection Mr. Schram has suggested to Mr. Storrs, managing director of the advisory council of the American Electric Railway Association, that it would be very appropriate for the association to participate by having at least four or five observers present to study the proposed operation.

Barr Bill Lost

The Barr bill in the Illinois Senate, providing for indeterminate franchises, is apparently a dead issue. Senator Barr recently announced that he would not press the Legislature to act on the measure. The Barr bill and a rival measure were voted out of the Senate public utility committee.

Senator Barr said that the principle of his bill was not opposed but differences of the manner in which the permits will be issued and safeguarded made it unwise to press the issue at this time. He is working on a new measure to authorize a committee to visit other states and investigate their handling of utility problems with the purpose of recommending action at the next General Assembly.

The House committee has recommended the Durso bill. This measure provides for a transportation board in Chicago with home rule in traction matters.

Arbitration in New Orleans

Because negotiations which have been under way since May 1 looking toward a settlement of the wage to be paid trainmen of the New Orleans Public Service, Inc., New Orleans, La., for the year beginning July 1 have been unsuccessful, arbitration is to decide the issue. Francis Williams will be the arbitrator for the employees. The men have asked for an advance in wages of approximately 10 per cent. The agreement under which the men are working calls for a scale of 47 cents an hour for the first six months, 49 cents for the succeeding six months and 51 cents thereafter. The company, it is said, is seeking certain reductions.

One-Man Car Law Attacked

The Knoxville Power & Light Company, Knoxville, Tenn., has brought action in the Chancery Court attacking the constitutionality of the state law forbidding the operation of "one-man" cars. The suit was brought by Charles T. Cates. He says that at the time the legislature passed the act the Knoxville company had 51 one-man cars and had just bought sixteen new ones at a cost of $135,000. The measure is attacked principally on the ground that it contains an arbitrary classification in which cities under 30,000 population are exempted. It is contended that the operating costs of the Knoxville company will be increased at least $115,000 a year if it has to employ two men on every car. The law prohibiting one-man operation becomes operative on Oct. 16, 1925.

Arbitration Sought by Worcester and Springfield Men

Employees of the Springfield Street Railway and the Worcester Consolidated Street Railway on May 29 asked that differences respecting wages and working conditions be submitted to arbitration. They named James H. Vahey as their choice for representative on the board. The agreement under which the men have been working expired on June 1. The request for arbitration was presented in writing after several fruitless conferences had been held. The men ask for 80 cents an hour in place of 68 cents for uniformed men on two-man cars. The company proposed a reduction of pay, but has been especially insistent on a change in the working conditions, to include a wider range of hours in place of the existing eight-in-eleven spread. In the event of arbitration proceedings the company demands a board of five members instead of three as hitherto. The men filed their request for arbitration as the 60-day limit for such action was about to expire. All hope has not been abandoned of reaching an agreement by direct conferences between the parties. Another joint meeting will be held before papers are signed submitting the dispute to arbitration.

News Notes

Authorizes Fare Advance.—Authority to the Omaha-Council Bluffs Street Railway, Omaha, Neb., to boost its fare so as to provide an additional annual revenue, totaling between $300,000 and $350,000, has been granted by the Nebraska Railway Commission. Company officials predict an increase in fare from 7 cents or 4 tickets for 25 cents to a cash fare of 10 cents or 3 tickets for 25 cents.

P. R. T. Case Reopens July 1.—The Public Service Commission has fixed July 1 as the date for resuming the Philadelphia Rapid Transit Company's rate case in Philadelphia, Pa. The hearing will be resumed where testimony was suspended, the commission planning to hear several experts who could not be heard the last time the case was aired. Dr. Milo R. Maltbie, called into the case by the commission at the request of Governor Pinchot, will attend the hearing. Dr. Maltbie recently announced that a revaluation would be necessary for the commission to determine the proper fare rate.

Fares Lowered.—The Rockford & Interurban Railway, Rockford, Ill., recently put into effect reductions of nearly 20 per cent in its fares under authority of the State Commerce Commission. The reductions include round-trip fares on Saturday and Sunday. Fares on connecting lines will not be changed nor will fares in the suburban districts.

Service Changes Announced. — Since the discontinuance of service by the Charleston Isle of Palms Traction Company, Charleston, S. C., the railway on Sullivan's Island and also on Mount Pleasant has been operated by the Mount Pleasant Railway, which bought in the Charleston Isle of Palms property when it failed. As soon as the bridge across Cove Inlet is completed cars will be operated from the ferry wharf on Mount Pleasant through Sullivan's Island to Breach Inlet.

Dollar Pass to Popularize Cars.—The Pacific Gas & Electric Company has put the $1 pass into effect in Sacramento, Cal., in the hope of increasing earnings. For some years now the company has earned no return on the value fixed by the State Railroad Commission. The Merchants' Association has commended the action of the railway.

Fares Cut.—Summer schedules and rates of fare on the Cœur d'Alene and Opportunity-Vera lines of the Spokane & Eastern Railway & Power Company, Spokane, Wash., were arranged recently at a conference of traffic and operating heads presided over by Waldo G. Paine, vice-president and general manager. The new fare schedule provides for week-end rates to be good going on Friday, Saturday and Sunday instead of on Saturday and Sunday. The return limit will be good until Monday. A reduction in one-way fares of 20 per cent for parties of ten or more is announced. This will be effective on the lines of the Inland Empire Railway as well as the Spokane & Eastern.

Agreement Terminated. — The Spokane United Railways, Spokane, Wash., is now ending its three-year "gentlemen's agreement" with the city. This provided a 7-cent cash fare and 6-cent ticket rate. The present arrangement expires on July 1. No announcement has been made by the railway officials on the fare situation.

Councilmen Hard Put for Things to Criticise.—Arguments advanced by the Louisville Railway, Louisville, Ky., for some weeks past for a 7-cent straight fare, instead of five tickets for 30 cents have spurred the City Council to go over a report made by the City Utilities Bureau. Baffled to find any real reason for complaint against the company, the Councilmen have sought to attract attention to themselves by criticising expenditures made for traveling, attending conventions, supplying autos to officials. As for the buses operated by the Kentucky Carriers, Inc., it is sought to establish the principle that the losses sustained in their operation should not be charged to the barometer fund of the company.

Permit Given for Selling Merchandise.—The New York Transit Commission recently approved applications by the Interborough Rapid Transit Company, New York, N. Y., and the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for permission to sell candy, gum and other merchandise in the city's newer subways. The privilege is expected to add about $150,000 a year to the revenues of each company. The action of the commission was taken under the provisions of the Nicoll-Clayton act, passed by the last Legislature and signed by Governor Smith. This eliminated from the rapid transit act the clause prohibiting the sale of anything but newspapers and the display of any advertising in the stations of the subways built under the dual contracts. The commission reserved the right of revocation and specified that vending might be carried on only under commission regulations.

Seek Increase—Reject Offer. — Employees of the Community Traction Company, Toledo, Ohio, have asked for an advance of 10 cents an hour. A counter-proposal of the company was that last year's wages be continued; this scale is 55 cents an hour for platform men on two-man cars and 60 cents an hour for the operators of one-man cars. The 1924 agreement with the company expired on June 1.

Financial and Corporate

Creditors in St. Louis Decline Fifty per Cent Offer

Creditors of the United Railways, St. Louis, Mo., who received judgment against the company prior to its receivership but who have not yet been paid, declined on May 29 to accept a 50 per cent settlement offer tendered by the reorganization committee. The reorganizers, through their counsel, Stanley Clarke, offered to pay the old judgment holders 50 cents on the dollar for the face of their judgment and also 50 per cent of the accrued interest. This offer was submitted in writing to a committee of lawyers representing the various creditors. The question of filing intervening petitions in the United States District Court was also discussed at the meeting. It was finally decided to appoint a committee to call on the various judgment creditors to obtain subscriptions toward defraying the cost of filing an intervening petition. Damage judgments approximating $375,000 are pending against the old United Railways.

Spokane Power Station Sold

Sale of the Nine-Mile power station, located on the Spokane River below the city of Spokane, by the Spokane & Eastern Railway & Power Company to the Washington Water Power Company of Spokane was announced on May 27. The transaction is the second large sale made by the bondholders of the old "Inland" system in recent years in the policy of disposing of properties of the former light and power system. The city lines of the old "Inland" were merged with the city railway system of the Washington Water Power Company in 1922, out of which the Spokane United Railways was formed. The power station supplied a portion of the new "United" system and all of the interurban lines. It has 20,000 hp. installed, consisting of four 5,000 hp. generators. The Washington Water Power Company has entered into a long-time contract to supply the interurban lines. Of the former "Inland" system only the interurban line, extending from Spokane to Cœur d'Alene, Idaho and a line through the Palouse wheat district to Moscow, Idaho, now remain. It is understood that those lines will eventually be sold by the bondholders. for whom the Harris Saving & Trust-Bank, Chicago, is trustee.

New York Railways Would Trade with Ninth Avenue Company

The New York Transit Commission held a hearing on May 20 on the New York Railways Corporation's application for permission to exchange $1,250,000 of its 6 per cent income bonds and 7,500 preferred shares of no par value for $3,000,000 in bonds of the Columbus & Ninth Avenue Railway. The holders of two-thirds of the bonds have agreed to the exchange, it was disclosed.

Commissioner John F. O'Ryan asked what would be the status of the owners of the remaining bonds if they did not agree to the exchange. He was informed that they would be total losers. Under the reorganization plan the bonds must be deposited on or before June 15.

The Columbus Avenue line runs from Fifty-ninth Street to 110th Street, New York City. It is regarded as an important link in the recently reorganized surface railway system. A group of bondholders, it was said, would be unlikely to agree to the reorganization plan because they would prefer to abandon the surface tracks and rely on the sale of their carhouse rights and duct franchise for reimbursement.

The replacement value of the Columbus Avenue railroad property, not including equipment, on Aug. 1, 1923, was estimated at $2,252,450 by Stone & Webster, engineers, at the hearing on the application of the New York Railways for permission to acquire the Columbus and Ninth Avenue line.

Reorganization Terms Announced for Kansas City

Bonded Indebtedness of Street Railway Is Slashed to an Initial Issue of $12,465,200 at 6 per Cent in a Reorganization Plan Made Public June 1—Old Stockholders Not to Participate

After deliberations extending over a period of many months the terms have been announced under which it is proposed to carry out the reorganization of the Kansas City Railways. The details were made public on June 1. The holders of the old preferred and the common stocks will not participate. A problem that still remains unsettled is the extent of the participation, if any, of the second mortgage bondholders and of J. Ogden Armour, with a claim of $1,500,000 for moneys advanced prior to the receivership. Stripped of the verbiage of the official document the plan has been reduced to this statement of fact:

PROPOSED IMMEDIATE CAPITAL DISTRIBUTION

Bonds, $12,465,200.

Preferred stock, $8,336,400.

Common stock, 182,645 shares of no par value.

Provisions for capital expansion: The first issue of bonds is not to exceed $20,000,000, of which at least $5,000,000 is to be held for property additions. A "prior preferred stock" may be issued later, but not in the reorganization.

Annual interest charge on bonds, $747,912.

Annual dividend required on preferred stock, $583,348.

Annual interest and dividend payments to be satisfied before common stock could enjoy dividends, $1,331,260.

Annual interest before receivership, $1,422,370.

New money to be invested, none.

Cash in receivers' treasury to be acquired by reorganizers (estimated), $5,000,000.

DISPOSITION OF TREASURY CASH

Course of treasury balance, surplus arising from 7, 7½ and 8-cent fare over a period in which no interest has been paid.

Settlements with injury claimants and lawyers, $1,350,000.

For working capital, reorganization expense and improvements, $3,650,000.

PREVIOUS LINE-UP OF SECURITIES

Face value of bonds and notes held by first mortgage interests in old company, $25,067,400.

Face value of securities (bonds and preferred stock) to be held by same interests in new company, $20,801,600. (This includes $1,350,000 in bonds to apply on a compromise with damage claimants.)

And in addition 182,645 shares of common stock.

Low ebb value (three and one-half years ago) of securities held by first mortgage interests, $7,500,000.

INTERESTS TAKEN CARE OF IN REORGANIZATION PLAN

First mortgage bond and noteholders; injury litigants and lawyers.

Interests which spurned a compromise offer, but may still be taken into the reorganization: Second mortgage bondholders; J. Ogden Armour.

PROPOSED DISTRIBUTION OF NEW SECURITIES

To holders of old first mortgage 5 per cent bonds, for each $1,000 bond, $400 in new 6 per cent bonds, plus $300 in preferred stock, plus seven shares of common stock.

(Of above bonds outstanding, $15,917,400.)

To holders of 7 per cent collateral notes, for each $1,000 note, $521.60 in new 6 per cent bonds, plus $391.20 in preferred stock, plus 7.824 shares of preferred stock.

(Of above notes outstanding, $7,750,000.)

Other noteholders, representing $1,400,000, to share in about same proportion.

To damage suit lawyers and their clients, $1,350,000 in cash and an equal amount in new 6 per cent bonds.

The new plan is being submitted to individual first mortgage bondholders and to noteholders by the reorganization committee, Melvin A. Traylor, H. L. Stuart, George W. Davison, P. W. Goebel, and J. K. Newman, the latter virtually occupying the position of reorganization manager in recent months. The plan provides for $12,465,200 in bonds as against $16,433,400 in a tentative plan that was drafted about a year ago.

The plan made public on June 1 is tentative in that it must be preceded by a foreclosure sale of the property and possibly may require the approval of Judge Kimbrough Stone. Foreclosure of the property has been ordered by the court with jurisdiction in the case, but the date of sale has not been advertised.

MAY COMPROMISE ON SECOND MORTGAGE

The termination of the receivership and the reorganization of the property as indicated faces an obstacle, in time at least, in the hostility of the second mortgage bondholders and of J. Ogden Armour. The latter is willing to lose his stock investment, but is striving to recover some part of the $1,500,000 advanced in a vain effort to ward off a receivership. These interests rejected a proffered compromise. The plan specifically authorizes the reorganizers to terminate this legal controversy, if they desire. Authority is given to make a settlement, if deemed satisfactory, in bonds, stock or the proceeds of a sale of either. This may mean a further enlargement of the capital issue.

The plan gives the reorganization committee power to bring Kansas City business interests into a minority ownership of the property. For six months after the reorganization, the committee can sell 20 per cent or less of the stock of the company to employees or to residents of Greater Kansas City at a price to be fixed by the committee. Any bondholder, however, can withdraw his individual shares from participation in such sales.

$557,243 Profit at Seattle

Municipal Railway Operation in 1924 Results in Much Better Showing than Was Made in 1923—Statistics of Operation Unusually Complete

FIGURES of earnings of the Seattle Municipal Railway, Seattle, Wash., for 1924 show that the road did much better last year than it did in 1923. Net income in 1924 was $557,243, compared with $169,636 in 1923. The report was transmitted to the Mayor and the City Council on March 30, 1925, by D. W. Henderson, general superintendent of railways, but has just been made public in pamphlet form.

The report follows previous statements in its form. There is no running comment and except for the chronology the report is devoid of text to accompany the many tables of statistics that are included.

One thing appears quite certain. Seattle has at last hit upon a productive rate of fare. It is true that a campaign is on to stimulate riding, but under the 10-cent cash fare with three tokens for 25 cents the results have not been at all bad. Passenger revenue last year was $6,083,238, compared with $5,643,088 in 1923, and revenue per pay passenger went from 7.2780 cents in 1923 to 8.2387 in 1924.

RATES OF FARE

Here is how Seattle has experimented with rates in the past:

May 9, 1914—Cash 5 cents; six tickets for 25 cents; 25 tickets for $1. Extra fare required on Lake Burien line outside city limits, or sixteen tickets for $1 good for full trip.

April 1, 1919—4⅙-cent and 6¼-cent tickets eliminated.

July 24, 1920—Cash fare, 10 cents. Token fare, 6¼ cents.

Jan. 9, 1921—Cash fare, 10 cents. Token fare, 8⅓ cents.

March 1, 1923—Cash fare, 5 cents. Transfers, 2 cents. Tokens, four for 25 cents good for fare with transfer.

STATISTICAL AND COMPARATIVE REPORT OF OPERATION OF THE SEATTLE MUNICIPAL STREET RAILWAY

	1924			1923		
Revenue—Operating	Amount	Per Car-Mile (Cts.)	Per Car-Hour (Cts.)	Amount	Per Car-Mile (Cts.)	Per Car Hour (Cts.)
Passenger car revenue	$6,043,981	37.08	343.29	$5,613,545	34.70	318.43
Special passenger car revenue	593	0	.03	651	0	.04
Automobile bus revenue	38,662	.24	2.20	29,543	.18	1.68
Municipal department passenger revenue	48,000	.29	2.73	48,000	.30	2.72
Freight revenue	29,621	.18	1.68	36,510	.23	2.07
Mail revenue	19,395	.13	1.10	17,643	.11	1.00
Miscellaneous transportation revenue	12	0	0	....	.....	......
Discounts and adjustments	*60,976*	*.37*	*3.46*	*55,295*	*.34*	*3.14*
Total operating revenue	$6,119,290	37.55	347.57	$5,690,598	35.18	322.80
Miscellaneous Revenues and Expenses						
General shops	*40,086*	*.25*	*2.28*	*38,162*	*.24*	*2.16*
Service equipment	*2,351*	*.01*	*.13*	*13,388*	*.08*	.76
Utility equipment	*182*	*0*	*.01*	*605*	*0*	*.03*
Electric current sold	946	.01	.05	464	0	.03
Rental of real estate and buildings	4,024	.02	.23	4,213	.03	.24
Rental of tracks and way facilities	23,892	.15	1.36	24,563	.15	1.37
Rental of transportation equipment	1,578	.01	.09	1,383	.01	.08
Station and car privileges	22,335	.13	1.27	18,162	.11	1.03
Lost and found department	*296*	*0*	*.02*	*207*	*0*	*.01*
Other miscellaneous revenue and expenses	1,840	.01	.10	2,763	.02	.16
Total miscellaneous revenue	11,699	.07	.66	813	0	.05
Total gross revenues	$6,130,989	37.62	348.23	$5,689,784	35.18	322.75
Summary of Operation						
Way and way structures	459,717	2.82	26.11	411,365	2.54	23.33
Conducting transportation	2,022,303	12.41	114.86	2,015,645	12.46	114.34
Maintenance of transportation equipment	455,935	2.80	25.90	387,492	2.40	21.98
Housing and hostling transportation equipment	206,294	1.27	11.72	185,308	1.15	10.51
Power	624,815	3.83	35.49	634,724	3.92	36.00
Commercial	53,472	.33	3.04	60,820	.38	3.45
General	299,885	1.84	17.03	335,636	2.07	19.04
Depreciation and amortization	685,114	4.20	38.91	685,114	4.24	38.87
Total operating expenses	$4,807,538	29.50	273.06	$4,716,106	29.16	267.52

INCOME STATEMENT

	Current Year		Previous Year	
	Dr.	Cr.	Dr.	Cr.
Operating revenues	....	$6,119,290	....	$5,690,598
Operating expenses	$4,807,538	....	$4,716,106	....
Operating income	....	1,311,751	....	974,497
Miscellaneous revenues and expenses	....	11,699	813	....
Gross income	....	1,323,450	....	973,678
Deductions from gross income	766,207	....	804,042	....
Net income	....	557,243	....	169,636

INCOME STATEMENT, SEATTLE MUNICIPAL STREET RAILWAY

	1924	1923
Operating revenues	$6,119,290	$5,690,598
Operating expenses	4,807,538	4,716,106
Operating income	$1,311,752	$974,492
Miscellaneous revenue	54,616	813
Gross income	$1,366,368	$973,678
Deductions from gross income	809,124	804,042
Net income	$557,244	$169,636

PROFIT AND LOSS

Losses accrued (other than income) current annual period		$11,527
Delayed losses accrued in prior periods:		
Cost of retiring plant	$12,642	
Plant retired—depreciation not fully accounted	184,463	
Additional cost of industrial insurance	613	
Adjustment of accounts receivable	777	
Material out of stores	229	198,726
		$210,253
Net income (profit and loss—1924)		369,430
		$579,683
Net income		557,243
Gains accrued (other than income) current annual period		2,602
Delayed gains accrued in prior periods		19,838
		$579,683

CONDENSED BALANCE SHEET OF SEATTLE MUNICIPAL STREET RAILWAY AS OF DEC. 31, 1924

CAPITAL ASSETS

Total capital assets	$13,893,167
Total redemption and special fund assets	648,609
Total current assets	1,144,503
Total deferred charges	67,813
Deficit—Dec. 31, 1924	615,928
	$16,370,022

CAPITAL LIABILITIES

Bonds outstanding:		
General lien bonds		$775,000
Utility revenue bonds		14,191,000
Total capital liabilities		$14,966,000

REDEMPTION AND SINKING FUND LIABILITIES

Unmatured accrued interest on funded debt:		
General lien bonds	$7,812	
Utility revenue bonds	236,683	
		$244,495
Matured unpaid interest on funded debt		3,572
Depreciation reserve fund audited and approved claims payable		16,261
Matured unpaid bonds		450
Total redemption and sinking fund liabilities		$264,779

CURRENT LIABILITIES

Amounts payable by current (operating) fund to other funds:		
To general fund	$249,237	
To Municipal Street Railway betterment fund	145,000	
To Municipal Railway bond 1919 construction fund	82,000	
To railway department depreciation reserve fund	90,000	
		$566,237
Amounts reserved on contractor's estimates		4,290
Tokens outstanding		73,157
Audited and approved claims payable		254,850
Warrants outstanding		240,706
Total current liabilities		$1,139,242
		$16,370,022

PAYROLLS AND VACATIONS 1924

Transportation:	Payrolls	Cost of Vacations
Office, inspectors, station masters	$107,539	$3,705
Trainmen	1,977,672	78,164
Shops and carhouses	544,631	6,855
Way and structures	497,712	18,651
Accounting	86,238	3,585
Total	$3,213,794	$110,961

SEGREGATION OF PASSENGER CAR-HOURS AND CAR-MILES

	Car-Hours	Car-Miles
One-man single truck	176,253	1,375,666
One-man double truck	636,066	6,185,501
Two-man	884,737	8,235,147
Buses	43,542	414,720
Total	1,740,598	16,211,034

OPERATING STATISTICS OF THE SEATTLE MUNICIPAL STREET RAILWAY

	1924	1923
Car-miles operated....	15,883,567	15,867,104
Car-hours operated....	1,717,052	1,730,174
Bus-miles operated....	414,720	306,499
Bus-hours operated....	43,542	32,725
Total car-miles........	16,298,287	16,173,603
Total car-hours.......	1,760,594	1,762,899
Average speed........	9.26	9.17
P. S. E. transfers......	7,063	9,437
S. & R. V. transfers....	882,738	799,233
Jitney transfers.......	414,798	334,390
Passengers at 2½ cents.	2,151,501	2,009,082
Passengers at 3 cents..	58,078	59,769
Passengers at 5 cents..	0	20,416,895
Passengers at 6¼ cents.	0	3,541,042
Passengers at 8⅓ cents.	66,060,792	47,311,552
Passengers at 10 cents.	4,841,895	3,699,648
Total pay passengers..	74,416,865	78,181,048
Deadheads...........	1,152,735	1,282,266
Transfers.............	18,697,374	18,500,376
Total passengers......	94,266,974	97,963,690
Pay passengers per car-mile...............	4.5659	4.8339
Total passengers per car-mile............	6.0570	5.7839
Total passengers per car-hour............	53.5427	55.5697
Passenger revenue.....	$6,083,238.19	$5,643,088.51
Miscellaneous revenue.	47,751.16	46,696.43
Gross revenue.........	6,130,989.35	5,689,784.94
Revenue per car-mile..	0.376174	0.351794
Revenue per pay passenger..............	0.082387	0.072780
Revenue per total passenger..............	0.065039	0.058081
Expenses, including depreciation..........	$4,807,538.52	$4,716,106.54

June 16, 1923—Cash fare, 10 cents. Token fare, 8⅓ cents. Transfers free.

Total gross revenue in 1924 was $6,130,989, compared with $5,689,784 in 1923, an increase of 7.75 per cent. Operating expenses, including depreciation, were $4,807,538 in 1924, compared with $4,716,106 in 1923, an increase of only 1.94 per cent. Except on five lines revenue exceeded expenses.

The number of employees was 1842, of whom 1,173 were trainmen, receiving 56 to 71 cents an hour. Twenty-two inspectors, instructors and station masters received $165 to $175 a month. Vacations for the employees cost the railway $110,961 out of a payroll of $3,213,794, or 3.4 per cent.

Accidents continue to be a source of concern. They totaled 5,207 in 1924, compared with 4,627 in 1923 and 3,989 in 1922. The cost of the injuries and damages account was $69,869 in 1924, compared with $81,708 in 1923 and $37,368 in 1922. In 1924 there were 240 step accidents on standing cars, compared with 225 the previous year, and 85 step accidents on moving cars, compared with 73 the previous year.

President Testifies on Valuation Issue

The fourth week in the hearing to place a valuation on the property of the United Railways & Electric Company, Baltimore, which is being conducted before the Maryland Public Service Commission, witnessed the appearance of Charles D. Emmons, president of the company. In his testimony Mr. Emmons said that at least $85,000,000 was a fair valuation of the property. The question of easements is expected to be one of the points to be fought with considerable energy on the part of Clarence W. Miles, people's counsel. The company also expects to complete its side of the case in the near future, including testimony dealing with the proposed $1 unlimited weekly pass. The company was ordered to present its side on the unlimited weekly pass following the filing of a petition.

The Great American Pyramids

Long denied what was justly due to them during the war-time period the utilities, particularly the light and power utilities, are coming into their own on the earnings side. This has been reflected market-wise in advances in quotations for the common stock of some of the companies that have attracted a big following from the public. On the other hand, several warnings have recently been sounded. For instance an article, "The Great American Pyramids," in *Barron's* for May 25 said that with its rates restricted to levels which will produce no more than a fair return it would seem that the speculative opportunities in stocks of the electrical utilities would not be large, but it said that the recent stock market activity of the stocks of some leading utilities is in striking contrast with this supposition. As indicative of some of the advances which have occurred in leading utility stocks in the past few years that paper cited the following:

Stock	1925 High	1921 Low	Per Cent Advance
American Water Works & Electric..	317½	4	7,837
Middle West Utilities	102¾	13	690
Stand. Gas & Electric	54⅞	7½	631
Am. Pwr. & Lt......	727⅝	54	1,247
Commonwealth Power	182¾	10	1,727

The figure given as the 1925 high for three of these stocks is not the actual high for the year to date, but is adjusted to give effect to capital readjustments which have been made since the 1921 low point was reached.

This authority says that the explanation of the extraordinary contrast between these figures and the theoretical supposition that utility securities offer little opportunity for speculative profit is simply the result of successful trading on the equity.

The relationship between capital structure and price movements is well illustrated by the market action of the stocks of the five leading independent electric utility companies of the country during the past four years. The group includes Brooklyn Edison, Commonwealth Edison, Detroit Edison, Edison Electric of Boston and Philadelphia Electric. The capital structure of Brooklyn Edison as of Dec. 31 last is typical of the group. It included $45,696,000 funded debt and $59,754,000 capital stock of one class. The following table indicates the comparatively moderate advance which has occurred in stocks of this type:

Stock	1925 High	1921 Low	Per Cent Advance
Brooklyn Edison	140	88	59
Commonwealth Edison	139	101½	37
Detroit Edison	124¼	88	41
Edison Elec., Boston.	214	142¼	50
Philadelphia Electric.	45⅞	21	118

As *Barron's* sees it, a comparison of this table with the previous table of the market movement of leading holding company stocks suggests the advantages of doing business on a shoestring, relatively speaking, when the trend is in the right direction. This note of warning, however, is sounded:

> How far may such a movement as has occurred in public utility holding company stocks in the last four years be expected to go? Regulatory commissions are not likely to permit utility companies to earn much more than an 8 per cent return on capital investment as a general rule. The process of pyramiding cannot with impunity be carried to the limit. Investors with good memories may remember the fate of the Rock Island Company and the Interborough Consolidated Corporation as horrible examples of "shoe-string" holding companies which fell upon evil days. A combination of increased operating costs and delay in granting rate increases would be disastrous to some public utility holding companies whose equities are particularly thin.

Scrapping of Equipment Misconstrued

Angles entirely unwarranted by the facts in the case have recently been given by the newspapers to the decision of the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa, to dismantle some 300 box cars. In fact, this decision on the part of the management has been made to appear as "another evidence of the decline of the railroad." It is no such thing. The decision of the management is not an unusual one. The cars in question have been written off. They were regarded as being beyond the stage where it would pay to expend any further sums in their rehabilitation. Such parts of the equipment as are worth salvaging will be redeemed.

This road has always done well financially and is doing so now. It is one of the most intensively developed short lines in the United States, exchanges equipment with the steam roads and routes its cars through to all parts of the country. The total mileage operated is 152, but the system, according to the latest official data, had more than 2,500 cars similar to the 300 now about to be scrapped in a proceeding that is neither new nor unusual except to the ill-informed.

Drum Organization Active at Detroit

A. L. Drum of A. L. Drum & Company, Chicago, Ill., has been engaged by the receivers of the Detroit United Railway as the executive manager to work for and with the receivers in laying out plans for the future operation of the D.U.R. properties. A complete survey of the D.U.R. system is being made.

Studies are also being made to determine changes to be made to improve service and better the railway company's financial condition. Certain changes in policy have become effective. The receivers have filed in federal court a petition for permission to issue $1,600,000 of receivers' certificates. The date of hearing was set for June 8.

Deficit on Interborough for Ten Months.—Total revenue of the Interborough Rapid Transit Company, New York, from all sources for April, 1925, was $5,142,256. After allowing for all operating expenses, taxes and income deductions there was a balance of $95,344. The statement also shows figures for the ten months ended April 30, 1925. The total revenue from all sources was $48,953,481, an increase of $656,637 over the corresponding period ended April 30, 1924. This increase, however, was more than offset by increased taxes and income deductions, the latter due chiefly to higher Manhattan (Elevated) rental, which became effective on July 1, 1924, under the readjustment plan.

Operating expenses during the period were lower than in the corresponding period of last year, but there was a deficit of $33,848 for the first ten months of the current fiscal year.

Revenues Decrease.—Total operating revenues for the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., for 1924 were $3,477,052, a decrease of $423,990 compared with 1923. Operating expenses were $3,127,536. The assets were $31,703,077, an increase of $353,573 over 1923. The company's list of investments for the year shows $13,600 for the purchase of the Indiana Motor Transit Company.

Merger Planned.—The Central Hudson Gas & Electric Company has asked permission of the Public Service Commission to acquire all outstanding stock of the Citizens' Railroad, Light & Power Company and the outstanding stock and mortgage bonds of the Southern Dutchess Gas & Electric Company, and to merge these companies. It desires also to purchase the stock of the Fishkill Electric Railway.

Manhattan Dividend Payments Authorized.—At the regular meeting of the board of directors of the Interborough Rapid Transit Company, New York, on June 2, the quarterly installment of Manhattan Elevated Company rental, due July 1, 1925, at the rate of $1.25 per share, was authorized. Payment of the deferred quarterly installment due on Jan. 1, 1925, at the rate of $1.25 per share, was also authorized. Both payments will be made on July 1, 1925, to stockholders of record on June 15.

Sale of Land Approved.—Sale of the four parcels of land at North Warren and West Hanover Streets, Trenton, N. J., by the Trenton & Princeton Traction Company has been approved by the Board of Public Utility Commissioners. The sale price was $85,000. The commission found that three of the properties involved were not needed for railway purposes. In the fourth instance the board's approval was given with the proviso that the Trenton & Princeton Traction Company and the New Jersey & Pennsylvania Railway be allowed by the new owner to use the land as a terminal.

More Valuation Evidence at St. Paul.—Supplemental evidence in regard to valuation of the properties and operating expenses of the St. Paul City Railway and the Minneapolis Street Railway, operating in St. Paul and Minneapolis, Minn., were to be admitted at the conference of the railway's representatives, the two cities and the Railroad and Warehouse Commission on June 1. The valuations of the two companies as given out by the commission two months ago was for 1922 in Minneapolis and 1924 in St. Paul. These may be brought up to date. Proponents of the plan to restore the neutral zone in St. Paul, abolished Jan. 7, 1922, with one fare to and from either city will be heard. The proceedings have to do with the determination of a permanent fare in the two cities based on a valuation of the properties. The rate is now 6 cents by arrangement with the Councils of the two cities. The companies are now in the jurisdiction of the State Railroad and Warehouse Commission.

Legal Notes

FEDERAL DISTRICT COURT.—*Trade Union Enjoined from Conspiracy to Obstruct Interstate Commerce.*

An injunction will lie to restrain employees of a telegraph company engaged in interstate business from conspiring to prevent it from performing its contracts by compelling it to discharge its employees who are not members of labor unions with which the defendant employees are affiliated. While an employee has a right to cease work, the cessation of work may be an affirmative step in an unlawful plan. One may not accept employment intending thereby to quit work when that act will enable him to perform one step in a criminal conspiracy. (Western Union Tel. Co. vs. International B. of E. W. 2 Fed. (Second) Rep., 993.)

FEDERAL SUPREME COURT.—*Commission Order Invalid When Confiscatory.*

Where the rates found by a regulatory body to be compensatory are attacked as being confiscatory, the court may inquire into the method by which the conclusion of the regulatory body was reached and may grant relief where the order was based on evidence which does not support the conclusions. The fact that the regulatory body issued the order for an experimental period does not alter its invalidity where the railroad's evidence tended to show that the existing rates, though higher than those fixed by the order, were confiscatory. (Northern Pacific Ry. et al. vs. Department of Public Works of Washington et al., 45 Supreme Court Rep., 412.)

MISSOURI.—*Humanitarian Rule as Applied to Infants.*

A child less than four years of age is in law incapable of contributory negligence, and in the application of the humanitarian rule, such a child is conclusively presumed to be oblivious of certain peril. (Moll vs. Wells, 270 Southwest Rep., 154.)

MISSOURI.—*Slippery Road No Excuse to Driver Operating Automobile at High Speed.*

In his opening statement, counsel for the plaintiff, the driver of an automobile, said his client saw the approaching street car when both were about 75 ft. away from the point where later the collision occurred, and that he tried to stop his automobile, but it skidded on the icy pavement and ran into the car. He claimed the car exceeded its lawful speed. The Supreme Court held that with this admission the Trial Court was warranted in closing the case at once and giving judgment to the defendant. (Wood vs. Wells, 270 Southwest Rep., 332.)

NEW HAMPSHIRE—*Part of Maintenance of Bridge over Steam Railroad May Be Placed on Street Railway Using Bridge.*

Under the New Hampshire law, a steam railroad must maintain the highway bridges over its tracks, and street railways are not allowed to use such bridges without the authority of the Public Service Commission. This case was in regard to the maintenance of a bridge over the tracks of the Boston & Maine Railroad, the bridge being used by a street railway which had not obtained the consent of the Public Service Commission to do so. It had, however, an agreement with the city for the use of the bridge. The court held that the primary duty of maintaining the bridge rests upon the steam railroad, but that the Public Service Commission may require the electric railway to pay any added expense made necessary by its use of the bridge. [City of Laconia vs. Boston & M. R.R. et al., 128 Atlantic Rep., 350.]

NEW JERSEY.—*Degree of Care Required at Passenger Station.*

While a common carrier of passengers must exercise a high degree of care as to its speeds and modes of conveyance of passengers, it is obliged to exercise only ordinary or reasonable care in the construction and maintenance of its station buildings, platforms and approaches. Hence, an instruction by the trial judge that it was the duty of the company "to use a high degree of care that the station should remain reasonably safe," was erroneous and harmful. (Holtzman vs. H. & M. R., 128 Atlantic Rep., 623.)

NEW JERSEY.—*Presumption of Negligence.*

In this case a passenger was injured when a car-door closed prematurely. In affirming the judgment in favor of the plaintiff the court quoted with approval the decision in an earlier case which says in part: "where a passenger shows that he was injured through some defect in the appliances of the carrier, which might have been prevented by due care, the jury may infer negligence, unless the carrier proves that due care was exercised. This inference is a legal inference in the sense that it is permitted by law, but not in the sense that it is required by law." (McPherson vs. Hudson & M. R., 128 Atlantic Rep., 231.)

NEW YORK—*Employee of One of Several Associated Lines Not an Employee of the Others.*

Ten railways, forming part of the Third Avenue Railway System, maintain jointly one employment bureau and school for instruction, from which men are sent sometimes to one line and sometimes to another of the associated group, or they may be transferred from one road to another. An employee of one of these lines was injured by a car of another line, and the company claimed that he was injured by a fellow servant and his only remedy was under the Workmen's Compensation Act. This plea was denied by the Court of Appeals. [Doran vs. New York City Interborough Railway, 147 Northeast Rep., 62.]

NEW YORK.—*Transportation of Passengers on Urban Line Not "Interstate Commerce."*

The International Railway operates all the street railways in Buffalo and has an interurban line to Niagara Falls and a connecting line running through Ontario to Queenstown, Ont. A trackman was killed while at work on one of the city lines in Buffalo, but the court held that he was not engaged in foreign commerce so as to make the company liable under the federal employers' act for his death. (Borelli vs. Internat. Ry. 127 Northeast Rep., 356.)

PENNSYLVANIA — *Truck Attempts to Beat Trolley Car at Crossing—Company Responsible.*

At a crossing on an interurban line, where the view was obscured, a truck with a number of workmen crossed in front of the trolley car. The driver and vehicle passed without collision, but several men in the truck jumped to escape injury and one was struck by the trolley car and was killed. The company and the driver of the truck were held jointly responsible. [Smith vs. Reading Transit & L. Co., 128 Atlantic Rep., 439.]

RHODE ISLAND.—*Position of Boarding Passenger When Car Starts.*

A street railway company does not have to wait until a passenger is seated until it starts a car, but only until the passenger has reached a position of safety. Hence, it was not negligent to start a car when a passenger had both feet placed solidly on the vestibule floor. (Straight vs. United Electric Rys., 128 Atlantic Rep., 571.)

WEST VIRGINIA.—*Eminent Domain for Transmission Line.*

A company operating an electric railway and also furnishing electric light, heat and power to commercial and industrial customers, is entitled to exercise eminent domain in the construction of transmission lines without obtaining a special permit from the Public Service Commission. (Monongahela-West Penn P. S. Co. vs. C. F. Cunningham Co., 127 Southeast Rep., 61.) (See also 127 S. E. Rep., 23.)

WEST VIRGINIA.—*Interurban Passenger Carried Beyond Destination Is Injured While Walking on Track.*

The plaintiff, a woman 52 years of age, and her married daughter, were carried a mile beyond their destination into a sparsely settled part of the city. They were directed to alight and come back on the next car, due in 15 minutes. It was about 9 p.m. Waiting for some time, they attempted to walk back on the track and fell off a trestle about 10 ft. high. Later they were picked up by an interurban car and taken home. Roads, safe and convenient for pedestrians, ran parallel to the track about a block away on each side, but the passengers were not aware of these roads. The Court of Appeals held that, as a matter of law, the plaintiff could not be held guilty of contributory negligence, preventing a recovery and declined to disturb a judgement for the plaintiff, awarded in the trial court. (White vs. Ohio Valley Electric Railway, 127 Southeast Rep., 56.)

Personal Items

Mr. Crawford Consultant

Well-Known Executive Establishes Himself in New York as Public Utility Expert

Norman McD. Crawford, formerly vice-president and treasurer of the Columbus Railway, Power & Light Company, Columbus, Ohio, has established himself in consulting practice at 95 Liberty Street, New York. He is prepared to act in public utility investigations and to report on financial, engineering and operating problems. Mr. Crawford left the company at Columbus in January last. He had anticipated taking things easy after a career of more than 40 years in public utility work. He did cut himself adrift from business for several months, but found idleness irksome. The necessity for him to be active does not exist, but he will undoubtedly be more than busy along lines of his own choosing

Norman McD. Crawford

Mr. Crawford's career in public utility work was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 31. Back of him there is a wealth of experience in practically all lines of electric public utility operation that makes it baffling to know just what to record and what to leave out in order to keep any record of his activities within bounds. Entirely aside from his managerial experience, this is not the first time that Mr. Crawford has engaged in consulting work. Way back in the early days of electric traction he had an engineering office in the World Building, New York, and in his capacity as engineer constructed the electric railway from Hartford to South Glastonbury, Conn. He also constructed the electric railway from Millville to Bridgeton, N. J., supervised the change in motive power from horse to electricity on the Jersey City-Bergen line and installed the Grand Avenue electric station in Jersey City. These are just a few of the things he did.

Later he was expert in connection with the Peoria, Ill., electrolysis case and the Dayton electrolysis case. As consulting engineer for the Connecticut Company he constructed the line from Hartford to Middletown. He was also tramway expert for the National Civic Federation in its investigating of public ownership and operation of tramways in England. Furthermore, he reported on the operation of the Second Avenue Railway in New York for the protective committee representing the bondholders.

Interlarded with this wide experience as a consulting engineer and expert Mr. Crawford served in various operating capacities, notably superintendent of the Meridan Horse Railroad, general manager of the Rochester Street Railway, general manager of the Hartford Street Railway, vice-president and general manager of the Ohio Electric Railway, president of the Mahoning & Shenango Railway, president of the Reading Transit & Light Company and vice-president and treasurer of the Columbus Railway, Light & Power Company.

This is a mere outline of the work of the man, but it does convey an idea of the wide range of his activities and the wealth of knowledge and experience at his command for application to such problems as may be brought before him in his present capacity of consulting engineer.

Officials of Public Service Bus Organization Reassigned

Changes in the duties of some of the employees of the Public Service Transportation Company, Newark, N. J., the bus operating subsidiary of the Public Service Railway, have been announced by Matthew R. Boylan, vice-president in charge of operation.

Fred M. Shipman, general superintendent of the auto maintenance department, is placed in full charge also of bus maintenance and repairs.

Frank P. Freeman is made assistant superintendent in charge of garages and servicing.

Howard G. Young becomes superintendent of shops and is stationed at the Irvington bus repair shop.

H. A. Benedict, mechanical engineer, will direct the work of handling the body repairs and painting.

Operating Managers Appointed for Long Island Lines

Gen. Lincoln C. Andrews, receiver, has announced that he has appointed the firm of Fisk & Roberts operating managers of the New York & Queens County Railway, the New York & Long Island Traction Company and the Long Island Electric Railway. In putting Fisk & Roberts in charge of the operation and rehabilitation of these New York City traction lines General Andrews was influenced in his choice by the previous record of the two members of the firm in public utility management and by his belief in the doctrine that best results can be secured from the properly directed enthusiasm of young men who have everything to gain from successful accomplishment on their part.

The railways in General Andrews' charge operate more than 100 miles of track serving most of the Borough of Queens in the city of New York and the county of Nassau lying just over the city line. Announcement was made in the ELECTRIC RAILWAY JOURNAL of May 9 of the organization of Fisk & Roberts, with New York offices at 82 Beaver Street.

Changes in Southwest Personnel

Messrs. Clifford and Bradley in New Roles with Stone & Webster Organization

George H. Clifford, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., winner of the Coffin award last year, brings a wealth of experience for application to his new position of southwestern district manager over all Stone & Webster properties in Texas, Louisiana and New Mexico. The properties involved embrace companies with many diversified interests, but Mr. Clifford's record with the Northern Texas Traction Company has proved that he has talents capable of wider application than was afforded in his work at Fort Worth.

Necessarily a man responsible for the operation of the property that carries off the coveted Coffin premium must have made a record that marks him apart from most other men in similar capacities. Competition for the Coffin award is keen. The prize goes to "that electric railway in the United States which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well-being of the public and for the benefit of the industry." And with the prize goes an unexpressed encomium to the manager of the property to which the award is made more far-reaching than any words of eulogy, however significant the terms in which they might be couched.

This man to whom promotion has now come more nearly in keeping with his talents was born at Fort Worth in 1881. He was graduated from the public schools and attended Weatherford College. After he left school he worked as a stenographer for several companies until 1901, when he entered the service of the Northern Texas Traction Company as secretary to F. M. Haines, general manager of the company, owned by the Bishop & Sherwin syndicate, Cleveland, Ohio. In 1903 Mr. Clifford was made secretary and treasurer of the company. This position he held until 1905, when the property was purchased by Stone & Webster of Boston, Mass. After the change in ownership he was made general superintendent. In 1910 he was elected vice-president and general manager of the Northern Texas Traction Company and in addition general manager of the Fort Worth Southern Traction Company, a 32-mile interurban line between Fort Worth and Cleburne, Tex., and the Arlington Light & Power Company, which is engaged in the water, light and ice business at Arlington, Tex.

G. H. Clifford

L. C. Bradley

Luke C. Bradley, succeeded by Mr. Clifford and now division manager in charge of the southeastern and southwestern districts for Stone & Webster with headquarters in Boston, was appointed district manager of the Stone & Webster properties in Texas in 1916. His service with Stone & Webster covers a period of 25 years. For the last 30 years he had been engaged in public utility work in responsible positions of an engineering and operating character throughout the United States. Mr. Bradley went to the gulf coast section of Texas in 1910 as vice-president of the Houston Electric Company, Galveston-Houston Electric Railway and Galveston Electric Company and manager of the two latter companies. In these capacities he was a constructive factor in the development of the Galveston-Houston territory. Early in 1913 he was appointed assistant district manager of the Stone & Webster properties in Texas, relieving Mr. Phinney of a large part of his duties as district manager. For a while the office was maintained in Dallas, but on account of its more centralized location with respect to the Stone & Webster properties headquarters were moved to Houston.

Obituary

B. S. Josselyn

Benage S. Josselyn, former president of the Portland Railway, Light & Power Company, now the Portland Electric Power Company, Portland, Ore., died on May 26.

He became president of the Portland Railway, Light & Power Company in 1907 and retained this position until 1913. Mr. Josselyn left school at the age of 14 and entered railroad service as a ticket clerk. He was identified at one time with the Kansas City, Osceola & Southern Railway, the Omaha & St. Louis and the Omaha, Kansas City & Eastern lines. During 1902 and 1903 he was general manager of the Hudson Valley Railway, Glens Falls, N. Y. Later he was general manager of the Union Terminal Railway in Sioux City and during 1906 and 1907 he was vice-president and general manager of the Maryland Telephone & Telegraph Company and the Baltimore Electric Power Company.

During the time he was president of the Portland property the River Plant at Estacada was built, the east side city line was rebuilt, several narrow-gage lines were changed to broad gage and many shops and carhouses were constructed.

L. C. Haynes

Louis C. Haynes, vice-president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and associated properties, died at his home in St. Louis, Mo., on May 22. He was 73 years old and had been active until a few days prior to his death. Mr. Haynes had been connected with the railway system at East St. Louis since 1902. Prior to that he had been engaged in the real estate business in East St. Louis. About 50 years ago he went to St. Louis as a reporter for the St. Louis *Daily Journal*. He also served the *Daily Leader* of Cleveland for several years as a reporter and assistant city editor. When the *Journal* was purchased by the late Joseph Pulitzer of the *Post-Dispatch*, Mr. Haynes organized the Haynes Realty & Financial Company. In the year 1893 he became connected with E. W. Clarke & Company, Philadelphia, and was assigned to administrative duties with the East St. Louis properties of the Clarke firm in 1902. He was an extensive traveler and wrote a brochure of his experiences on a trip to the Holy Land several years ago.

T. A. H. Hay

Thomas A. H. Hay, for eight years secretary of the Easton Board of Trade, and pioneer in construction of electric interurban railroads in Easton, Pa., and vicinity, died on May 28 in a Philadelphia hospital, at the age of 69. He was a member of many organizations, including the Pennsylvania Society of New York and the Manhattan Club, and had been president of the Zeta Psi fraternity. His brother, W. O. Hay, is vice-president and general manager of the Northampton Transit Company, Easton.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Trade Statistics Not Illegal

Supreme Court Explains Status of Dissemination of Business Information —Holds Public Interests Served

A decision clarifying the legal view of trade association activities in gathering and distributing statistics was handed down by the United States Supreme Court on June 1 when decrees of lower courts enjoining the Maple Flooring Manufacturers' Association and the Cement Manufacturers' Protective Association under the Sherman anti-trust law were reversed. The decision was by a divided court, six to three. The majority opinion was delivered by Justice Stone, the newest member of the court, who, as Attorney-General, had given considerable study to the question of trade statistics at the request of the Department of Commerce.

Justice McReynolds entered a vigorous dissent in each of the two cases on the ground that the tendency of the activities complained of by the government clearly was to enrich the members of the associations by controlling production or prices or both to the detriment of the consumer. Chief Justice Taft and Justice Sanford dissented in each case on the ground that the evidence brought these cases within the rule laid down by the court previously in decisions sustaining decrees against the American Column & Lumber Company and the American Linseed Oil Company.

The majority opinion, however, holds that in these previous cases clear intent to evade the law was established, while in the cases at issue circumstances were different.

The principal decision was read in connection with the decree issued by the District Court in Michigan against the Maple Flooring Manufacturers' Association. The association operates principally in Michigan, Minnesota and Wisconsin. It gathered and distributed statistics of production, stocks, unfilled orders and average sales prices; it published a book giving railroad rates from Cadillac, Mich., to some 1,000 points in the country, and members held meetings where statistics and other matters were discussed. These things in themselves do not constitute restraint of trade, the majority opinion holds.

The Cement Manufacturers' Protective Association operated along similar lines of gathering and distributing information. In addition, in this case the question of distributing information regarding specific job contracts was involved. The government sued in the District Court of Southern New York for an injunction, alleging violation of the Sherman law, and was given a decree. Justice Stone, for the majority of the Supreme Court, predicated his opinion in the cement case on that in the flooring manufacturers' case, adding that information regarding specific job contracts was not violative of the law, because it had not been established that contractors suffered, but merely that the system protected manufacturers against contractors who might take advantage of such contracts for cement if the market was favorable.

After reciting the history of the case, the majority opinion in the flooring manufacturers' association case lays down broad principles in part as follows:

> It is not, we think, open to question that the dissemination of pertinent information concerning any trade or business tends to stabilize that trade or business and to produce uniformity of price and trade practice. Exchange of price quotations of market commodities tends to produce uniformity of prices in the markets of the world. Knowledge of the supplies of available merchandise tends to prevent over-production and to avoid the economic disturbances produced by business crises resulting from over-production. But the natural effect of the acquisition of wider and more scientific knowledge of business conditions on the minds of the individuals engaged in commerce and its consequent effect in stabilizing production and price can hardly be deemed a restaint of commerce or, if so, it cannot, we think, be said to be an unreasonable restraint, or in any respect unlawful.
>
> It is the consensus of opinion of economists and of many of the most important agencies of government that the public interest is served by the gathering and dissemination, in the widest possible manner, of information with respect to the production and distribution, cost and prices of actual sales of market commodities, because the making available of such information tends to stabilize trade and industry, to produce fairer price levels and to avoid the waste which inevitably attends the unintelligent conduct of economic enterprise. Free competition means a free and open market among both buyers and sellers for the sale and distribution of commodities. Competition does not become less free merely because the conduct of commercial operations becomes more intelligent through the free distribution of knowledge of all the essential factors entering into the commercial transaction. Restraint upon free competition begins when improper use is made of that information through any concerted action which operates to restrain the freedom of action of those who buy and sell.
>
> It was not the purpose or the intent of the Sherman anti-trust law to inhibit the intelligent conduct of business operations, nor do we conceive that its purpose was to suppress such influences as might affect the operations of interstate commerce through the application to them of the individual intelligence of those engaged in commerce, enlightened by accurate information as to the essential elements of the economics of a trade or business, however gathered or disseminated. Persons who unite in gathering and disseminating information in trade journals and statistical reports on industry; who gather and publish statistics as to the amount of production of commodities in interstate commerce, and who report market prices are not engaged in unlawful conspiracies in restraint of trade merely because the ultimate result of their efforts may be to stabilize prices or limit production through a better understanding of economic laws and a more general ability to conform to them, for the simple reason that the Sherman law neither repeals economic laws nor prohibits the gathering and dissemination of information. Sellers of any commodity who guide the daily conduct of their business on the basis of market reports would hardly be deemed to be conspirators engaged in restraint of interstate commerce.

The court ruled that such information gathered and disseminated among the members of a trade might be the basis of agreement or concerted action to lessen production arbitrarily or to raise prices beyond the levels of production and price which would prevail if no such agreement or concerted action ensued, and those engaged in commerce were left free to base individual initiative on full information of the essential elements of their business. Such concerted action constitutes a restraint of commerce and was illegal and might be enjoined as might any other combination or activity necessarily resulting in such concerted action as was the subject of consideration in American Column & Lumber Company vs. United States *supra* and United States vs. American Linseed Oil Company *supra*. But in the absence of proof of such agreement or concerted action under the present plan of operation of defendants no basis could be found in the gathering and dissemination of such information or in their activities under their present organization for the inference that such concerted action would necessarily result within the rule laid down in those cases.

Rubber Prices Rebound

Rubber at 70 cents gives new proof of the utter impossibility of controlling programs intended to restrict production. After having stated that they would be satisfied with 32 cents the British find that they are not able to augment production quickly when the need arises.

The high price may be worth enduring as it will boom rubber production outside of British possessions, it is pointed out. The weakness of any control of production is that it tends to stimulate production on one end and to restrict consumption on the other. Sooner or later this process breaks down the control. In the case of rubber, in addition to the increases of production in the Dutch possessions, which are pledged not to restrict production, and in other rubber-growing areas there will be larger resort to secondary supplies. The reclamation of rubber, which is done very successfully, is profitable when the price of the raw material is high.

It also is expected that present prices will reduce the rate of consumption very materially. Even in the case of a commodity such as coffee price increases reduce the amount used. The recent advance in the price of coffee is said to have discouraged consumption to the extent of 25 per cent.

Metal, Coal and Material Prices

Metals—New York	June 2, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	8.425
Zinc, cents per lb	7.32
Tin, Straits, cents per lb	54.875
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2 125
Central, Ill., screenings, Chicago, net tons	1 875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.01

Change in Status of Bureau of Mines

After mature consideration officials of the Department of Justice are understood to be of the opinion that there is no legal reason why the Bureau of Mines may not be transferred to the Department of Commerce. It was said in the ELECTRIC RAILWAY JOURNAL issue of April 4, page 567, that this transfer was expected.

The organic act of the Department of Commerce empowers the President to transfer to that department any scientific agency, outside the Department of Agriculture, that he may see fit. The Bureau of Mines was created after the Department of Commerce. For years there has been a question as to the application of the law to that particular bureau. The doubt now has been removed and it is assumed that the administration will indicate its faith in its own reorganization plan and make the transfer.

Rolling Stock

Key System Transit Company, Oakland, Cal., has been advised by the Board of Engineers, which has been conducting a traffic study of that property, to purchase 100 new cars over a period of three years. Of this number 30 are to be purchased at once.

Havana Electric Railway, Light & Power Company, Havana, Cuba, during 1924 built and equipped 50 new model passenger cars and reconstructed four old-type cars. The construction of 50 additional new cars was authorized, of which fifteen were begun. The new model bodies are lighter, stronger and more durable. They have seats for 36 passengers, against 32 for most of the old type, and the aisles and platforms are wider so they can accommodate more passengers and carry them more comfortably. The average weight of the new cars with modern motors is 17,500 lb. The older types weigh about 20,000 lb. The only important change in car body construction during the year was the substitution of riveted steel floor frames for the wood beam construction formerly used. The steel frames are lighter, cheaper and stronger.

Chicago & Joliet Electric Railway, Joliet, Ill., has purchased four Mack 25-passenger city-type buses to be placed in operation on city routes.

Department of Street Railways, Detroit, Mich., has received permission through the City Council to purchase ten Reo pay-enter buses.

Oklahoma Railway, Oklahoma City, Okla., has placed an order for three Reo pay-enter buses.

Track and Line

Seattle, Wash.—The City Council utilities committee recently took steps toward the extension of the Cowen Park line by recommending the passage of an ordinance which provides that $72,000 required to finance the extension be raised through sale of negotiable interest-bearing street railway department warrants. As proposed, a wooden trestle, 687 ft. long, will be constructed through Cowen Park and the railway tracks extended on Fifteenth Avenue from Ravenna Place to Victory Way.

Philadelphia Rapid Transit Company, Philadelphia, Pa., plans to make extensions by laying a single track on Venango Street between Twenty-second Street and a point near Twenty-third Street, and a single track on Hunting Park Avenue between Twenty-second Street and a point approximately 200 ft. east of the central line of Wissahickon Avenue. The Board of City Surveyors has approved the plans on the ground that the object of the new line was to facilitate the routing and handling of cars and to afford accommodations to the large number of persons employed in large industrial plants.

Municipal Railway of St. Petersburg, St. Petersburg, Fla., will soon complete its $200,000 railway improvement program. The double tracking of Second Street north from First to Fifth Avenues has been completed and workmen are paving between the tracks. Locust Street from Fifteenth to Twenty-first Avenue has also been completed. Work will be started about the end of July on Euclid Boulevard from Fifteenth Street to Thirty-fifth Street.

Los Angeles Railway, Los Angeles, Cal., has started work on the extension of Melrose Avenue from Normandie Avenue to Western. The company is also planning the Fifth Street extension to make that street a through street.

Trade Notes

American Manganese Steel Company, Chicago Heights, Ill., has placed in operation a new foundry at Los Angeles Cal., for the manufacture of Amsco steel casings. The new Los Angeles foundry is of steel construction throughout. The organization has facilities for producing about 25,000 tons of manganese steel casings annually.

Nugent Steel Castings Company, Chicago, Ill., manufacturer of small and thin section steel castings, has recently placed in operation an electric annealing furnace for the treatment, in this manner, of its entire product.

Moreland Motor Truck Company, Los Angeles, Cal., has just brought out a six-wheel truck suitable for handling materials used in truck and highway construction for transmitting coal. It is of 6-ton capacity and is equipped with a four-cylinder or six-cylinder engine, depending on the service to be given. It can be geared for a speed of 35 m.p.h. if desired. A special feature of the chassis construction is the use of six wheels.

Austin Company, Cleveland, Ohio, has been awarded a general contract covering the design, erection and equipment of the new plant of the G. A. Gray Company, Cincinnati, one of the largest manufacturers of steel planers. The new plant under construction in the Idlewild district will represent an investment of practically $1,000,000. The equipment installed under the Austin contract includes heating, lighting, plumbing, air and gas lines, electric equipment, sprinkler system, railroad trackage and boiler house equipment. The contract requires that construction work of the building be completed in 90 working days, with an additional 30 days for the installation of equipment. This will bring the Gray Company into complete possession of its new building in the fall of the year.

Conveyors Corporation of America, Chicago, Ill., announces that the Kent Engineering Company district representative has removed his office to 716-718 Builders Exchange Building, Minneoplis, Minn. The Kent Engineering Company handles the sale of American steam jet ash conveyors, airtight doors, ash gates and other power plant supplies in Minnesota and adjacent territory.

New Advertising Literature

Electric Railway Equipment Company, Cincinnati, Ohio, has issued a new catalogue of "Elreco Tubular Steel Pole Tables and Pole Fittings." Elreco pole table, giving weight, section lengths and deflection under various loads, are published in this pamphlet, "with the idea of assisting prospective customers or engineers to select without difficulty the size and weight pole most suitable for their particular conditions."

Conveyors Corporation of America, Chicago, Ill., has issued a folder called "American Air-Tight Doors." It discusses the air-tight door for ash-pits, boiler settings and other locations where an air-tight door is needed.

Electric Machinery Manufacturing Company, Minneapolis, Minn., has issued bulletin No. 799 on automatic starters for synchronous motors. This booklet is illustrated and contains a separate bulletin, No. 785A, dated November, 1924, listing some users of the Electric Machinery synchronous motors.

Roller-Smith Company, New York, N. Y., has issued two new bulletins on two new lines of apparatus. Bulletin 400 covers two lines of small direct-current panel type instruments. Supplement to Bulletin 530 describes the new non-closable on overload circuit breaker recently brought out by the company.

Cleveland Twist Drill Company, Cleveland, Ohio, has issued catalog No. 41, a 243-page pamphlet with index and illustrations showing all its regular tools and a few special tools. In this new catalog are found several new items, such as special drills for bakelite and slate, a new small jobbers' carbon drill set and a complete new section of mechanical data with useful information for shop men.

DeVilbiss Manufacturing Company, Toledo, Ohio, has issued a folder which describes the DeVilbiss spray-painting equipment necessary for doing refinishing work with pyroxylin finish or lacquer enamels.

Una Welding & Bonding Company, Cleveland, Ohio, has issued Bulletin No. 113, called "A Continuous Path of Copper from Rail to Rail."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 · New York, Saturday, June 13, 1925 · *Number* 24

Detroit Municipal System the Prey of Politicians?

POLITICS has laid its heavy hand on the Detroit Municipal Railway. Ross Schram, general manager, and I. N. Merritt, auditor, are out. Mr. Schram was dismissed by Mayor John H. Smith for "inexperience and inefficiency" and for "neglect to furnish me with reports which I have repeatedly requested." Mr. Schram charges that it was impossible to get the Mayor's attention. One charge or the other is false. It ought not to be difficult to determine which one. Apparently taking the cue from these cases, C. E. Wilcox, claims attorney, sent in his resignation the following day. He gave no reason for retiring from the public service. Two members of the Street Railway Commission voted with the Mayor for dismissal. The other member is in Europe. Following the announcement of the dismissal Commissioner Barlum ran to political cover by putting the incubus for the removal upon the Mayor. It is understood that during his campaign Mayor Smith openly stated that if elected he would remove Mr. Schram.

The Detroit *Free Press* almost cites in justification of Mr. Schram's removal the political doctrine that to the victor belongs the spoils. It charges that in the first place Mr. Schram "was given a place under the Street Railway Commission purely as a reward for political services." It attributes Mr. Schram's present discomfiture to the "natural fortune of a war in which he engaged of his own accord." Apparently it never thought much of Mr. Schram. The comment of that paper begs the whole question. Undoubtedly had there been no politics in the matter there would be no municipal ownership in Detroit today. If politics may be said to account for Mr. Schram, does it also apply to Mr. Merritt and Mr. Wilcox? On the other hand, the Detroit *News* says that the reason for Mr. Schram's dismissal is not inexperience or inefficiency. That paper says it is politics and that Mayor Smith would have been honest if he had said so.

While fair treatment of the individual is a matter of concern to ELECTRIC RAILWAY JOURNAL, the principle underlying the action is of far greater moment. If Mayor Smith is right about Mr. Schram's inexperience and inefficiency, then W. B. Mayo, chief engineer of the Ford Company and former general manager of the railway, a man of great talent and wide experience, is wrong. It was he who recommended Mr. Schram for the job. Perhaps Mr. Schram's attitude toward the Mayor was not as conciliatory as the relative positions of the two men appeared to demand, but as between the judgment of Mr. Smith and Mr. Mayo, the weight of evidence seems to be with Mr. Mayo. As for the charge of inexperience, ELECTRIC RAILWAY JOURNAL, if it so desired, could publish a long list of men with no previous electric railway experience who have made conspicuous successes in electric railway work. Previous experience is undoubtedly an aid to success, but it is by no means an assurance of success.

Mr. Wallace, the new general manager, has wide experience. He is a capable operator. He had been assured that politics will not be allowed to interfere with his work. It is to be hoped that it will not, but in view of what has happened he does not enter upon his new duties under auspicious circumstances or prospects that are promising. If he doesn't play with politics, politics may play with him. The poison of politics is particularly penetrating. In this connection these words of the ELECTRIC RAILWAY JOURNAL, uttered only three weeks ago, were ominous: "When the bird of political patronage flies in at the window the competent ones will go out at the door. It is anybody's guess how long it will be before that event takes place." At this long distance the only conclusion that can be drawn is that the railway is apparently slated for political picking. If this be true, Detroit is face to face with calamity.

Realigning the Interurbans for More Effective Service

SIGNIFICANT action that may lead to a new set-up of the interurban lines was taken at the recent meeting of the Central Electric Railway Association. Following the lead of John A. Beeler, who outlines the situation in a paper abstracted elsewhere in this issue, the association passed a resolution to the effect that the lines in the central territory should be consolidated into one system. This is a radical move, but it is dictated by necessity, as Mr. Beeler pointed out.

The interurbans in the Middle West have been making a game fight during the past few years. It has, however, been a losing one. Passenger business has fallen off and little else has been developed to take its place. The result is that the revenues have been decreasing. As with properties all over the country, expenses have been increasing meanwhile, until the margin between income and outgo has been wiped out. Some of the properties have been forced into receivership, while others are barely able to meet their charges.

Consolidation of these properties would have many beneficial effects. Centralization of control in one aggressive management would do much to improve the situation. As it is, there are many small companies with interests more or less in common. Agreement on policies and practices that might have been beneficial to the participating companies often has not been reached. The reason for this lack of progressiveness has not always been well founded.

A new alignment of the properties would permit many economies, but better still it would make possible a new conception of service. Freight could be routed through without the difficulties that inhere in the present method. This would allow the system to obtain new sources of revenue. High-speed passenger service could be given in some places, with parlor car and sleeper service between principal cities. Local passengers, on the other hand, could be handled better on light-weight cars or on buses than in the 50-ton cars now used by most of the railways under consideration.

To make such a plan effective would require the addition of considerable new capital. The roads in this territory are now taking in some $48,000,000 annually, with operating deductions of about $39,000,000. Fixed charges amount to approximately $12,000,000. It is estimated that some $5,000,000 to $10,000,000 would be necessary for the purchase of equipment. But with this comparatively small capital outlay this annual loss of some $3,000,000 could be changed into an annual surplus of like amount. More money could be used with profit to provide additional trackage and to build belt lines around some of the larger cities. Surely here is something worth while. It requires only capitalists with sufficient vision to realize that here is an opportunity not only for profit but for real service to all who reside in this territory.

Telling the Public that the Railway Is Ready and Anxious to Serve

WHEN a traveler alights from a train in a strange town it is a rare occurrence for him to see any sign that will indicate whether the trolley lines in that city afford a direct route to the various hotels or even to the business district. Rather than use the time and take the trouble to inquire, the stranger usually hires a taxicab and spends from five to ten times as much as would be necessary to travel by electric car; sometimes for a ride of only a few blocks.

Electric railway officials perhaps assume that the public knows which local line is the principal link between the station and the center of the city, but they forget that strangers wish to know the particular car that will serve their needs, where it can be boarded and when it will leave. Some railways have taken steps to fill this need, but the majority have not.

Another phase of this service that should be given attention is the arrangement of schedules so that cars will be available when trains arrive. Even if the traveler knows that the trolley line reaches his destination, if a car is not at hand when he wants it, he will use some other conveyance which is ready to take him.

There are many ways to furnish the information and service desired. An employee stationed at such points to direct strangers would probably be the most effective method, but conspicuous signs near or in the station, located so that they will catch the eye of prospective passengers, would be of value. A stranger alighting from a train usually looks about for directions. A flashing electric sign would be sure to attract his attention. There is a need for this kind of advertising, and the traveling public should be advised at every possible opportunity that a wide-awake electric railway is ready and anxious to serve it in that particular city.

Use of Street Railway Tracks by Other Vehicles Causes Needless Delay

CASES where traffic regulating authorities show any interest in keeping street car tracks free of other vehicles are rare compared to the number of cases where they are entirely indifferent. Yet it is often the moving vehicle, so called, rather than the parked vehicle that is the cause of interference and delay to railway operation.

At street intersections where "stop" and "go" traffic regulation is enforced, all vehicles must stop while the cross movement occurs. Moving vehicles which have been following the railway tracks stop in the path of the cars. Two or three such vehicles may force the car to stop at a considerable distance from the intersection. When the street is open to traffic again, the other vehicles hurry across, but the car usually must make a second stop at the intersection to accommodate the passengers waiting there. During this second stop the direction of traffic movement is quite likely to be changed, necessitating a considerable additional wait on the part of the trolley.

Had the other vehicles been required to keep to the side of the street they would have been delayed at the intersection no longer than they were when standing on the tracks. The street car, however, carrying many more people than the automobiles, is subject to altogether unnecessary delay from their presence ahead of the car. No one denies that theoretically street cars should have right of way on their own rails. In practice, however, very little is done to see that they get it. If city officials are really desirous of doing something to promote the orderly and expeditious movement of traffic in the street, a great improvement can be made at small cost by keeping other vehicles out of the car tracks.

Public Utility Advertising Is a Real Benefit to the Consumer

SOME super-critical citizens are apt to take exception at times to the spending of money by an electric railway in publicity. Whether it is in the form of newspaper displays or other kinds of advertising, these critics contend that the money thus spent might better be devoted to reducing fares or extending the service. Especially is this the case when the publicity is of the nature known as good-will advertising.

In an address at the recent meeting of the Associated Advertising Clubs of the World, Martin J. Insull of Chicago points out that a utility, by advertising, can secure more business and a larger gross income. This means production on a larger scale and usually with greater economy. Necessarily, all of this gain goes to the user, as under commission rule the utility is not allowed to receive any larger net return per dollar invested after it is already earning a fair return on its capital.

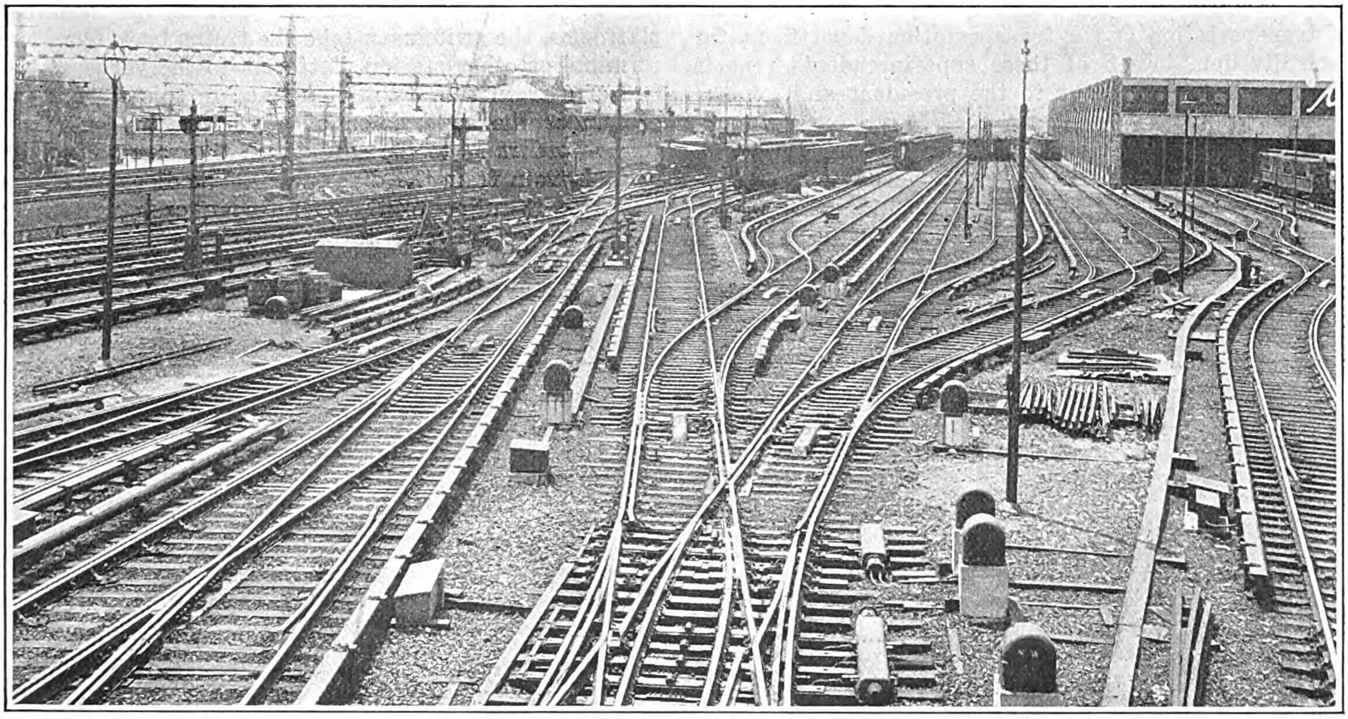
While the gain to the consumer from good will advertising is possibly less apparent than that from advertising an extension of the service, it is none the less real if it helps to bring about fairer treatment by the public. Moreover, this means that the business of the utility is less hazardous and consequently that the utility can borrow at lower interest rates.

Those who criticise utilities for incurring expenses for publicity explain their attitude on the ground that the utility is a monopoly. They freely admit that the business world as a whole accepts advertising as a necessity. Of course, any other position would not be tenable at the present day, but the argument is put forth that the same reasons for such advertising do not exist with a utility where there is no competition.

In a certain sense, however, no utility, even if it is protected by law from competition, is a monopoly. In the case of a railway there is always the competition of private means of transport—such as walking and the automobile or people can stay at home and not use any transportation. Advertising is needed to develop business even for a so-called monopoly. In fact, it would be rather difficult to prove that a utility really has much of any less need to advertise what it has to sell than a competitive business.

Train Operation by the Interborough

Functions of the Transportation Department of a Rapid Transit Railway Differ from Those of a Surface Line Because of the Arduous Operating Conditions—Organization of the Interborough Rapid Transit Company and Duties of Various Classes of Employees Are Described



Yard at East 180th Street, Borough of the Bronx, Where Trains Are Made Up. This Is One of a Number of Such Yards in Various Locations

CONDITIONS of operation on a rapid transit line differ materially from those on a surface line because of the clear right-of-way, the high speed which has to be maintained between stops, the greater traffic, operation under the restrictions as regards clearance usually inseparable with a subway and elevated railway as compared with surface operation, etc. In New York city these restrictive and arduous conditions are probably found at their maximum. For these reasons an account of the methods on the Interborough subway should prove of interest to other companies, especially those whose operation tends to become heavier in character.

Some striking examples of the volume of traffic on the Interborough Rapid Transit System in New York, the mileage made daily by its cars and the effect of the severe conditions of operation on the maintenance of its equipment were published in the first part of an article in the issue of this paper for March 19, describing the maintenance practice of the Interborough company. There are still other conditions which make its methods of dispatching and operating trains notable. Some of these will be briefly mentioned:

The Interborough Rapid Transit Railway is the only rapid transit railway operating ten-car trains in regular and continuous service.

It has the largest number of miles of rapid transit track and the largest number of miles of subway track in the world.

It is the only rapid transit railway employing in train service an average of materially less than one trainman per car.

Including the Manhattan division, it carries more than 1,000,000,000 revenue passengers per year, which is considerably in excess of any other rapid transit line.

New York City is the only city with any considerable amount of four-track rapid transit railway, two tracks being used for local service and two for express.

New York is the only city in which rapid transit trains are operated continually at maximum speeds of 45 m.p.h. on as close a headway as less than two minutes.

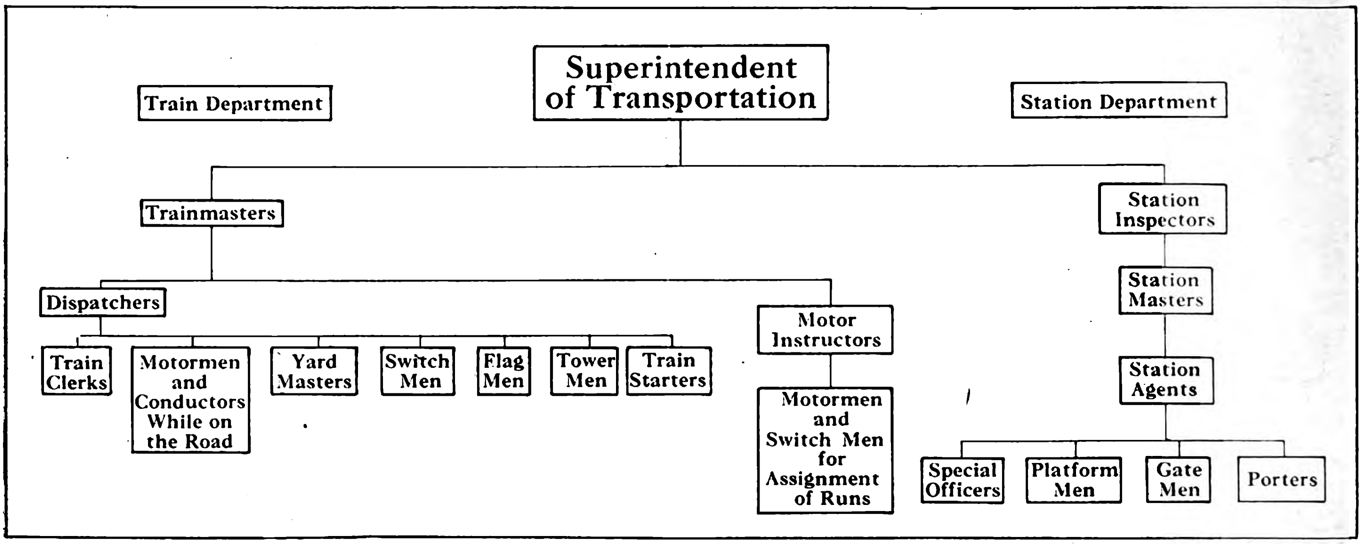
It is needless to say that very few of the passengers on the subway trains of the Interborough Rapid Transit Company realize the elaborate organization required to give this transportation service or the extensive precautions in use to insure the safety of the passengers. It is probable that even among railway men there is not a full conception of the methods used by the transportation and other departments to keep in operation the subway trains which most of these railway men use as passengers when they visit New York. It is the intention of this journal to publish several articles relating to a number of these different matters, notably the organization of the transportation department, the systems of lighting, ventilation, pumping, emergency block alarms, telephones for regular and emergency use in the subway and signaling, and the system of multiple-unit door control. Several articles on the inspection shops and maintenance practice have already appeared.*

The present article will describe the organization of the transportation department and the method of dispatching and checking train service.

DUTIES OF SUPERINTENDENTS AND TRAINMASTERS

For purposes of operation the transportation organization on the subway division of the Interborough Rapid Transit Company is kept entirely separate from the elevated division, and the company has a superintendent of transportation and a transportation department for each division. Each of these superintendents reports directly to the assistant to the president and general manager.

On the subway division, which is the division being considered in this article, the transportation department is divided into two sub-departments, namely, that for the operation of trains and that for the direction of passenger stations. Both of these departments are in charge of the superintendent of transportation. His immediate assistants in the operation of trains are the trainmasters and in the direction of passenger stations are the station inspectors, as shown in the organization chart. This article will first outline the department in charge of the operation of trains.



This Chart Shows the Organization of the Transportation Department of the Interborough Rapid Transit Company for Subway Service

There are two trainmasters, one for day service and the other for night service, each with an assistant known as the assistant trainmaster. They exercise a general supervision over and are directly responsible for all employees connected with the train service and see that the trains move regularly. In case of accident or serious detention to trains they are expected to go at once to the place of trouble and assist in removing the cause.

SWITCHMEN TAKE TRAINS FROM YARDS AND DELIVER THEM AT TERMINALS

In the operation of the trains on the subway, the cars are not taken from the carhouses in the way that is usually followed on surface lines. There the crew reports to the carhouse and takes the car out from that point as a terminal. In the subway operation the crews, instead, report at a terminal, such as 242d Street or Woodlawn (two northern terminals), or at some intermediate station which is the terminal of a run, like Dyckman Street. They report there to the starter and begin their runs there.

The work of taking the cars to these terminals and putting them into their berths preparatory to a run is conducted by a different class of men, called "switchmen." This is necessary because the trains are made up of cars which may be on one track and may be on another track of the yards or carhouse. Besides making up the trains and taking them to the terminal platforms, the switchmen take the trains back from the terminal or other station platforms to the yards at the end of a train run. While engaged in this work, they are under the supervision of a yardmaster, but they receive orders as to the cars which they are to include in each train from the dispatcher. The dispatcher also instructs them as to the time when each particular train is to be delivered to the terminal platform ready for operation.

The standard ten-car train of the company is made up of seven motor cars and three trailers. These cars are always arranged in the following order, beginning with the north end of a train:

Motor, trailer, motor, trailer, motor, motor, motor, motor, trailer, motor.

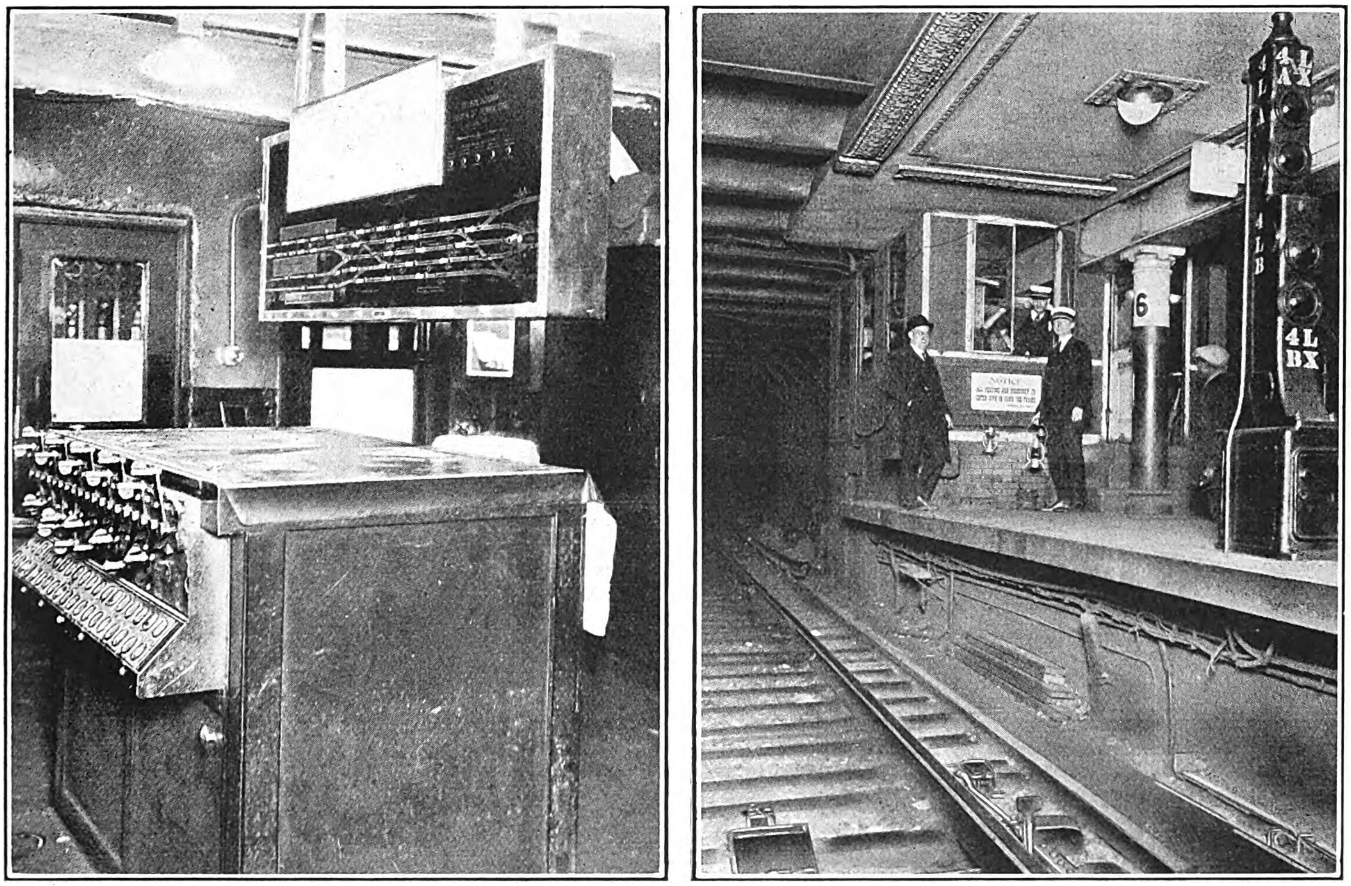
The switchmen are uniformed, and while in the subway and between sunset and sunrise in the open they carry lanterns, so their position may be known to other employees. The maximum speed at which they are allowed to operate trains at any time is 18 m.p.h., or the series position. On sharp curves and while crossing switches, the maximum speed permitted is only 9 m.p.h. Under no circumstances are they allowed to back trains at any point.

The switchmen are responsible not only for making up trains and operating them between yard and terminal platform but also for seeing that the train is in good condition before it is put in service by the car crew. This means that before the train is taken to the terminal platform the switchmen must see that the air brakes have been tested, that the safety gates have been properly locked, that the overhead door-control operating switches are in the proper position, that the train-line jumper is properly inserted between the cars and the cover down over the jumper plug, that the indication jumper is properly inserted between all cars, that the indication short-circuiting plugs are inserted in the front and rear ends of the trains only, that all safety chains are connected properly between cars, that the bell cords are properly connected through the cars and in working order, that the motorman indication tests O.K. from the operating control on both ends of the train, that the battery switches are cut in, and that all other apparatus is in good condition.

---

*See ELECTRIC RAILWAY JOURNAL for May 3, 1924; Aug. 16, 1924; Aug. 30, 1924; March 21, 1925.

Switchmen are also particularly enjoined to watch for defects in switches, signals and car equipment, especially during cold and stormy weather. They are in a good position to do this because they operate their trains slowly, and as they bring their trains into a station they can report promptly any defect noticed before their train receives passengers. The switchmen report to the dispatcher before going to work as well as when leaving work.



At Left—Illuminated Chart, Showing Position of Trains, in Switch Tower at 33d Street Station, West Side Lines. At Right—Dispatcher's Office at the North End of the 96th Street Station, West Side Lines. One of the Automatic Trips Is Shown Just Outside the Rail Near the Bottom of the Picture

As the switchmen are held responsible for the good condition of the trains as they are brought into the terminals and turned over to the car crews, their names also appear on the train sheet.

Starters Regulate Train Movement

There is a starter at every terminal station where trains are crewed. They have charge of receiving the empty train from the switchmen and turning it over to the crew. They see that these men are in proper condition and at their posts on the train when the train is ready to start, and in the absence of a train clerk, they ring the terminal bell to start the train. In the case of absence of a conductor or guard, the starter assigns the position to an extra and submits a record of the absence to the train dispatcher each day.

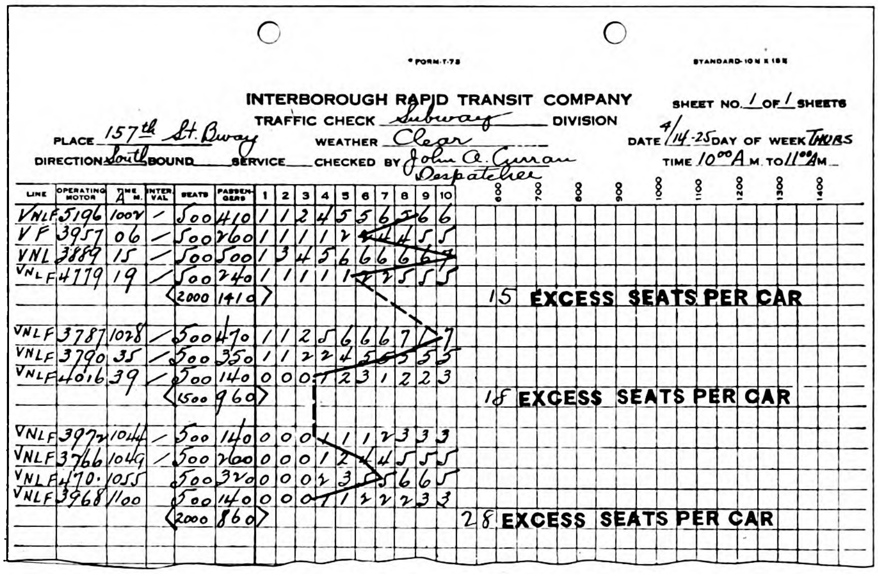
Starters at intermediate and terminal points also promptly report to the nearest terminal dispatcher and to other intermediate starters all unusual intervals between trains, and under the direction of the dispatcher they regulate the train movement and restore the trains to their regular intervals. Starters are also authorized to take charge at all unusual occurrences in train service in the vicinity of their stations in the absence of their superior officer, though at once notifying the superintendent, trainmaster or nearest train dispatcher of the event.

Train Dispatchers Turn Back Trains at Crossovers to Avoid Gaps

Train dispatchers are distributed along the line and each dispatcher has direct charge of the movements of trains within his section and of all transportation employees while in that section. Thus, on the Broadway-Seventh Avenue line there are six locations where dispatchers are on duty at all hours of the day and night, one eighteen-hour dispatching point and one nine-hour location. The dispatchers report to the superintendent, trainmasters and assistant trainmasters.

The dispatchers watch the operation of trains, and if there is any gap or serious delays in the train service they report the fact by phone to the trainmaster, who has authority to order trains turned at crossovers to avoid blockades on the entire line.

Train dispatchers at terminals also have charge of the yards and sidings at those terminals. At such points,



FORM-T-78

INTERBOROUGH RAPID TRANSIT COMPANY

SHEET NO. 1 OF 1 SHEETS

TRAFFIC CHECK Subway DIVISION

PLACE 157th St. Bway WEATHER Clear DATE 4/14-25 DAY OF WEEK THURS

DIRECTION South BOUND SERVICE CHECKED BY John A. Curran Despatcher TIME 10⁰⁰ A.M. TO 11⁰⁰ A.M.

LINE	OPERATING MOTOR	TIME A.M.	INTERVAL	SEATS	PASSENGERS	1	2	3	4	5	6	7	8	9	10	600 700 800 900 1000 1100 1200 1300 1400
VNLF	5196	1002	–	500	410	1	1	2	4	5	5	6	5	6	6	
VF	3957	06	–	500	260	1	1	1	1	2	4	4	4	5	5	
VNL	3889	15	–	500	500	1	3	4	5	6	6	6	6	6	7	
VNLF	4779	19	–	500	240	1	1	1	1	1	2	2	5	5	5	
				2000	1410											15 EXCESS SEATS PER CAR
VNLF	3787	1028	–	500	470	1	1	2	5	6	6	6	7	7	7	
VNLF	3790	35	–	500	350	1	1	2	2	4	5	5	5	5	5	
VNLF	4016	39	–	500	140	0	0	0	1	2	3	1	2	2	3	
				1500	960											18 EXCESS SEATS PER CAR
VNLF	3972	1044	–	500	140	0	0	0	1	1	1	2	3	3	3	
VNLF	3766	1049	–	500	260	0	0	0	1	2	4	4	5	5	5	
VNLF	470·	1055		500	320	0	0	0	2	3	5	5	6	6	5	
VNLF	3968	1100		500	140	0	0	0	1	1	2	2	2	3	3	
				2000	860											28 EXCESS SEATS PER CAR

Form Used by the Traffic Checkers in Counting Traffic. The Graph in the Form Is Plotted by the Staff in the Traffic Bureau After the Report Is Received

day, giving the exact number of miles of those cars approaching a high mileage. These cars are then marked on the train sheet by the dispatcher for removal the following day by the switchmen so that they may be sent to one of the inspection shops.

TOWERMEN CONTROL SWITCHES

The towermen are responsible for the safe passage of trains over the switches in their charge. They are under the immediate supervision of the trainmasters of the division to which they are assigned and they obey all orders and signals in relation to the movement of switches and signals and the movement of trains given by the dispatcher on their section.

In the open portions of the subway they occupy towers commanding a good view of the track, as on steam railroads. These towers are not illuminated at night, as light would interfere with the vision of the signals and approaching trains by the towerman. In the subway the towerman often occupies a portion of the dispatcher's office.

In the most important signal towers there is an illuminated board, made of a frame of ground glass, on which the routes in the neighborhood of that station are painted. Along each route is a series of lights which show red or green on the board. The board is connected automatically to the various signal sections in the track, so that a clear section of track will show by green lights on the board and the presence of a train on a section will be shown by red lights. The normal indication of the interlocking home signals is "stop" and of distance signals is "caution." The signal levers are kept in the position giving these indications except when the signals are cleared for immediate train movement. Hence when a train enters its berth at a terminal station the signals are set against its leaving the station until its time of departure, as determined by the dispatcher. When the leaving time arrives, the dispatcher notifies the towerman to set the signals and switches for the departure of the train. This message is sent by an electric annunciator.

The track switches are operated by air, controlled by electric circuits and arranged by interlock so that a switch cannot be thrown unless the signal is correct and corresponds to the position of the switch. Compressed air for the switches is obtained from compressed air

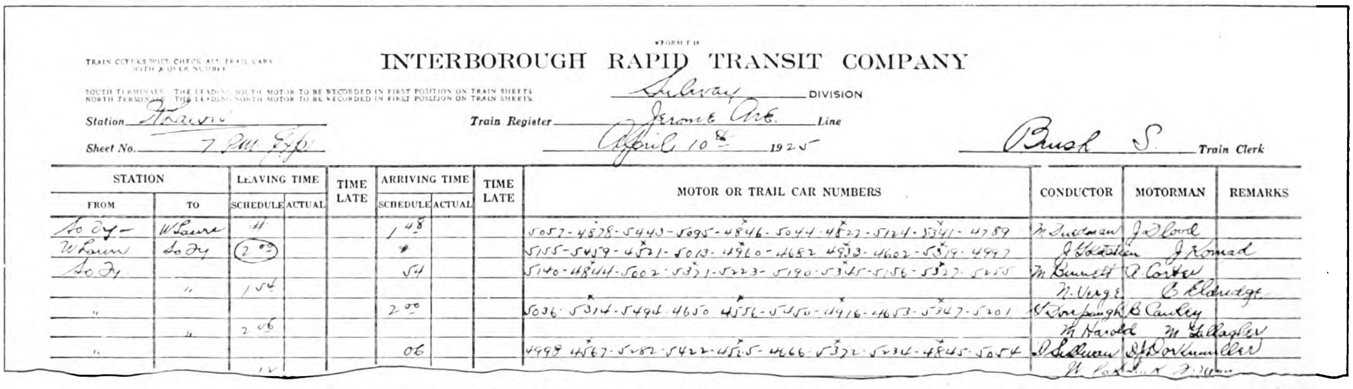
also, they have charge of the making up of trains in the sense that they instruct the yardmaster of what cars to use in train makeup and how they are to be placed. They also have supervision of the starters at these points and see that the motormen and trainmen are ready for duty at the prescribed time and have all the time-tables, signals, lamps and other fixtures required by the rules for the operation of their trains.

TRAIN CLERKS CHECK HEADWAYS

Each dispatcher has in his office a train clerk who keeps a record of the number of each car arriving and departing from his station, with the route, arriving time, leaving time, etc. The records of this kind made at a terminal station show also the names of the conductor and motorman of that train and also the names of the switchmen who deliver the train at the terminal. A typical record of this kind is reproduced below.

The train clerks at points other than at terminals keep a similar record except that they do not fill in the names of the car crews.

Copies of these train sheets, as prepared at a terminal station, showing the numbers of the cars making up each train, are sent to the mileage department at 147th Street and Lenox Avenue. At the mileage department records are kept of the mileage of each car, and as a car approaches the mileage at which it is due for inspection the number is sent to all dispatchers and trainmasters. Such a list is submitted to these officials each



TRAIN CLERKS WILL CHECK ALL TRAIL CARS WITH X OVER NUMBER

SOUTH TERMINALS – THE LEADING SOUTH MOTOR TO BE RECORDED IN FIRST POSITION ON TRAIN SHEETS
NORTH TERMINALS – THE LEADING NORTH MOTOR TO BE RECORDED IN FIRST POSITION ON TRAIN SHEETS

INTERBOROUGH RAPID TRANSIT COMPANY

Subway DIVISION

Station [illegible]

Train Register Jerome Ave. Line

Sheet No. 7 PM Exp

April 10th 1925

Bush S. Train Clerk

STATION		LEAVING TIME		TIME LATE	ARRIVING TIME		TIME LATE	MOTOR OR TRAIL CAR NUMBERS	CONDUCTOR	MOTORMAN	REMARKS
FROM	TO	SCHEDULE	ACTUAL		SCHEDULE	ACTUAL					
So Fy–	W Lawn	#			1 48			5057-4878-5443-5095-4846-5044-4827-5124-5341-4789	M Tuckman	J. Hood	
W Lawn	So Fy	2 00			*			5155-5459-4521-5013-4960-4682 4933-4602-5519-4997	J Goldstein	J Konrad	
So Fy					54			5140-4844-5002-5371-5223-5190-5345-5156-5327-5255	M Bennett	A Cortez	
	"	1 54							N. Verge	B Eldridge	
"					2 00			5036-5314-5494-4650 4556-5450-4916-4653-5347-5201	S Dorpaugh	B Cauley	
	"	2 06							M Harold	M Gallagher	
"					06			4998 4567-5282-5422-4525-4666-5372-5234-4845-5054	D Sullivan	J Dorkenmiller	
		12							[illegible]	[illegible]	

Upper Part of Train Sheet, Filled Out with Car Numbers, Names of Motormen, Etc., as Used on the Interborough Subway System lines, supplied with air from compressing stations at different points and is carried in the subway at a pressure of from 65 to 70 lb. The electrical circuit to operate these compressed air valves is supplied through a storage battery at 20 volts. Edison alkaline storage batteries are used. There are two sets of batteries in each dispatcher's office, with fourteen cells in each set, each cell supplying about 1½ volts. One of these sets is charging while the other is discharging, and they are alternated each day.

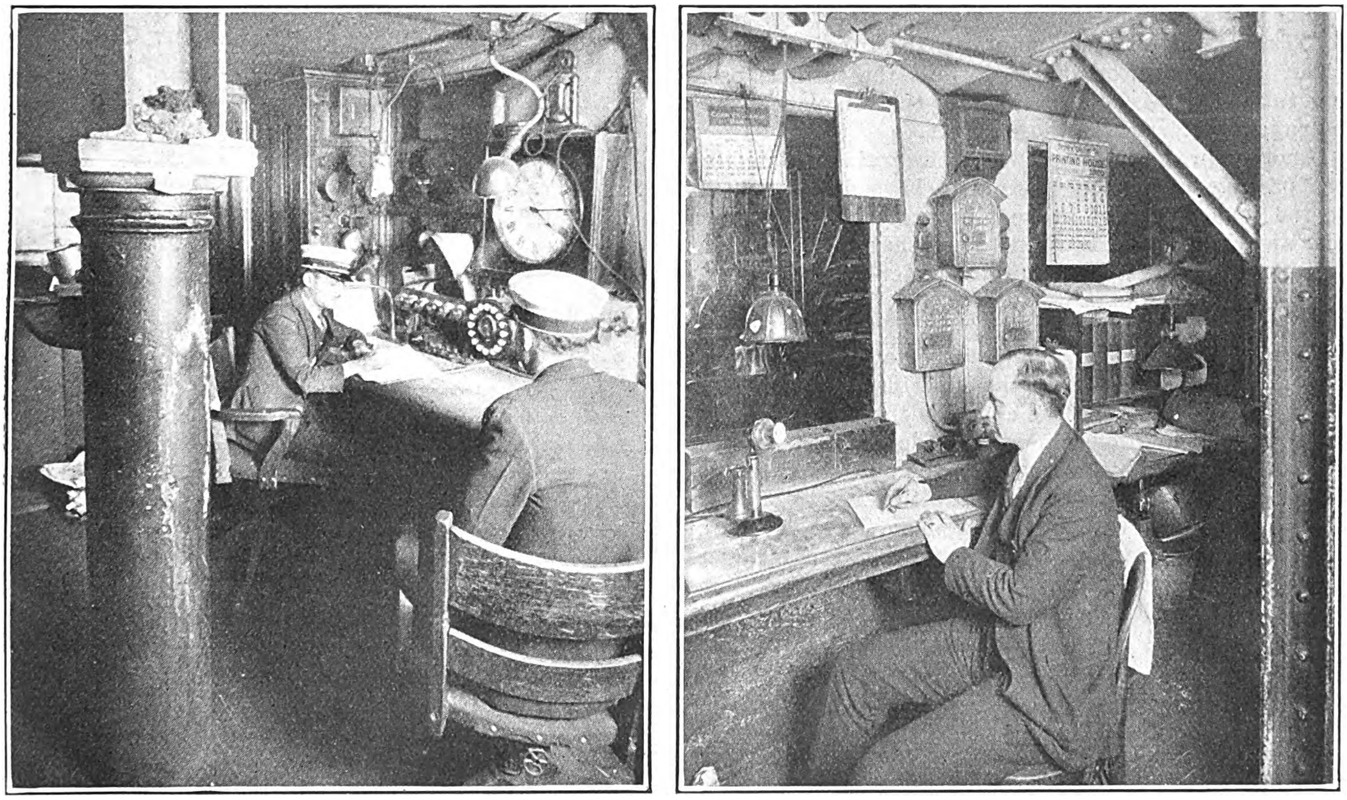
Each towerman's office is equipped also with a stockroom of signal supplies. These include a supply of all kinds of wire suitable for signals and tagged with tags of different colors and numbers to indicate exactly where they go. There is also a variety of lamps, kerosene, electric, etc. A feature of the practice of the company is that lamps carried by the signal men are fitted with a green roundel, while all others carry a red or white roundel. This is to indicate the men who have authority in regard to the signals.

TRAINMEN

The trainmen report fully equipped to the starter at least ten minutes before the scheduled time for starting, or as much earlier as may be required. The rules also require them, if obliged to be absent on account of sickness or other unavoidable cause, to notify the motor instructor by telephone or letter at least two hours before reporting time.

Before leaving the terminal station, the motorman must test the air brake by placing the brake valve in service position to make certain that both the pneumatic brake and the electro-pneumatic brake are in good condition. He then observes the fall of the black hand on the air gage to determine the length of the brake pipe. Next he places the brake valve in full electric release position and observes the rise of the black hand and the fall of the red hand on the air gage to determine the number of cars in the train or the length of brake pipe and main line pipe. He then moves the electric brake switch to the "on" position and immediately back to the "off" position, listening for the exhaust of the air from the emergency magnet valve in the cab. He then closes the switch, but runs with caution until a running test of the electro-pneumatic brakes is made.

Motormen are also responsible for seeing that their front and rear markers are properly set and lighted. They hand in at the terminals at the ends of their runs time cards showing the amount of time made, actual reporting time and leaving time. These times are capable of being checked and are checked against the coasting clock record, as each trail car is equipped with a coasting clock.



At Left—The Interior of the Dispatcher's Office, 96th Street Station, West Side Lines. At Right—The Train Clerk's Office at the Same Station. The Position of the Train Clerk Is Such that He Can Observe and Make a Record of the Numbers of All Cars as They Pass on the Tracks in Front of Him

The general responsibility for the train is on the conductor and orders in regard to the general operation of the train are sent to him. He is responsible, for instance, for seeing that hand brakes are let off before the train starts from the yard or siding, that the tail lights are properly set and lighted, that the safety gates between the cars and at the end of the train are kept properly locked, that the bell and bell cord are in proper working order throughout the train before it starts, that the trainmaster or dispatcher is notified promptly of any defects which interfere with the proper and safe working of trains, etc. He is also directly in charge of the passengers and is responsible for seeing that they are discharged at the nearest station in case a train is disabled, that unruly passengers keep order or are ejected, and similar duties. In cases of emergency the conductor has authority to give the motorman orders to skip stations, but he must make a written report to the dispatcher of all stations skipped.

The guards are under the direction orders of the conductor. It is their duty to operate the door switches, announce stations and assist the conductor in his general duties in caring for the safe operation of the train. The rear guard also has the duty of protecting the rear of his train by going back with flag and lantern when his train comes to a stop at an unusual point where it is not protected by signal.

MAXIMUM SPEED OF TRAINS IS 45 M.P.H.

The maximum speed permitted to trains in the subway is 45 m.p.h., but this is not allowed when the cars are descending heavy grades or while passing any switch or frog or while rounding any curves. The speed is reduced to from 9 to 20 m.p.h. over switches, to 20 m.p.h. while passing the shafts of the river tubes, and to 35 m.p.h. at all other points in the tubes under the river. The reduction in speed while the train is passing tube shafts is due to the fact that employees may be engaged at work at those points.

Another precaution used while the trains are making the passage under the river is to have at least 60 lb. to the square inch of brake pipe pressure. Motormen and switchmen are required to see that the gage is at this point before they enter an under-river tube.

STATION EMPLOYEES COLLECT ALL FARES

Another division of the transportation department also under the direction of the superintendent of transportation, as shown on the chart, is the station department. The chief officers in this department are the station inspectors, who report to the superintendent of transportation. There are four station inspectors, two for day duty and two for night. They have charge of all station masters, station agents, platform men and porters, and also of the gatemen at the few stations at which turnstiles are not used but tickets are sold.

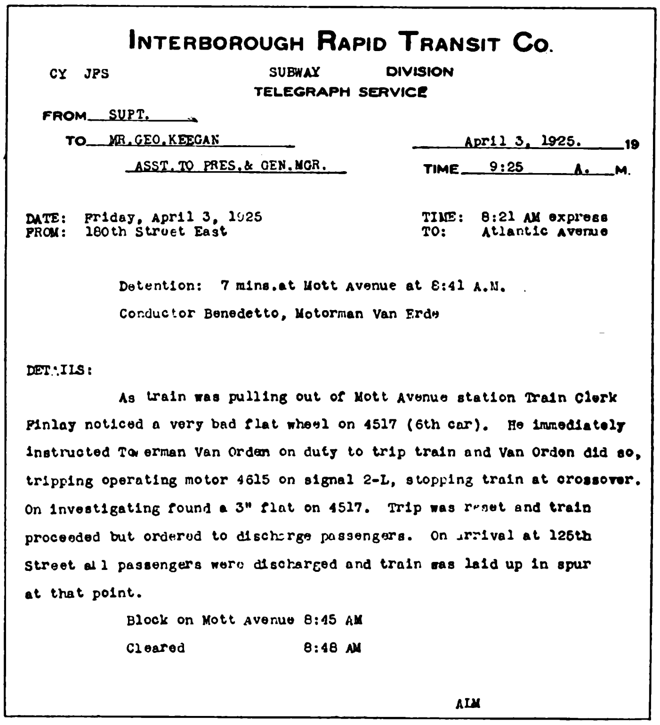
The system is divided into zones, each directly in charge of a station master, who is responsible for seeing that the stations within that zone are kept clean and in order and that all station men on their stations perform their duties, though these station men report to and receive instructions from the station inspector rather than from the station master. The station agents are the fiscal officers of the stations. While under the immediate direction of the station master, they report to the treasurer of the company in regard to the cash received and to the comptroller of the company as to their tickets and turnstile accounts. They are also responsible, in the absence of a station master, for seeing that the ticket offices, station room, platform, stairways, etc., are kept clean. The station agents are provided with safes to accommodate the funds received by them. These funds are collected each day by representatives from the treasurer's department who give receipts to the agents for the amounts of money collected.

A great deal of this money, of course, is in small denominations, and agents are instructed to give this out in change, as far as they can, without giving offense, to the company's patrons. They are also authorized to supply banks, trust companies, business houses and local tradesmen of established reputation with coin in exchange for currency, but they are not allowed to deliver such coin themselves or to send it by any employee of the company or to allow it to leave the booth until the currency has been delivered.

The primary duty of the platform men is to serve passengers and speed their movements onto and off trains during train stops. When a train arrives at a station these men stand at the car doors and see that no passengers enter until those desiring to disembark have done so. After the passengers have boarded the trains, they assist in closing the doors and see that all doors are properly closed before the train leaves the station. If the train should be delayed, they find out the cause and immediately notify the station master or station agent.

TRAFFIC DEPARTMENT CHECKS LOADING

As on all large properties, there is a traffic department in charge of schedules and traffic check. The traffic checkers and the schedule makers are under the general direction of the superintendent of transportation, though all schedules have to receive the approval of the general manager of the company before they can go into effect. They also have to receive the approval of the New York Transit Commission.



INTERBOROUGH RAPID TRANSIT CO.

CY JPS SUBWAY DIVISION

TELEGRAPH SERVICE

FROM SUPT.

TO MR. GEO. KEEGAN

ASST. TO PRES. & GEN. MGR.

April 3, 1925. 19

TIME 9:25 A. M.

DATE: Friday, April 3, 1925
FROM: 180th Street East

TIME: 8:21 AM express
TO: Atlantic Avenue

Detention: 7 mins. at Mott Avenue at 8:41 A.M.

Conductor Benedetto, Motorman Van Erde

DETAILS:

As train was pulling out of Mott Avenue station Train Clerk Finlay noticed a very bad flat wheel on 4517 (6th car). He immediately instructed Towerman Van Orden on duty to trip train and Van Orden did so, tripping operating motor 4615 on signal 2-L, stopping train at crossover. On investigating found a 3" flat on 4517. Trip was reset and train proceeded but ordered to discharge passengers. On arrival at 125th Street all passengers were discharged and train was laid up in spur at that point.

Block on Mott Avenue 8:45 AM

Cleared 8:48 AM

AIM

Form Used for Reporting Delays to Trains

The traffic checkers move constantly about the system under instructions from the trainmaster and count the loading of cars and headway of trains on both local and express tracks. When counting traffic, they are stationed at the departing end of a station, so as to count the passengers on the cars as they pass the traffic point while the train is under acceleration. The form used by them for recording these observations is illustrated on page 920.

The first vertical column in this form calls for the line or route. The next column calls for the number of the first car in the trains passing the observation point and the next column the intervals between trains. The next two columns call for the total number of seats in the train and the total number of passengers. The figures of these two columns are calculated from the figures in the following ten columns. These show the number of passengers (in tens) in each of the cars of the train. The maximum length of train in the subway is ten cars, so there are ten columns. Each car has 50 seats, so that a car with all seats occupied and no standing passengers would be marked a 5 in this column; a car with twenty passengers, a 2; a car with ten standing passengers, a 6; a car with twenty standing passengers, a 7, etc. The traffic checkers have become very expert and can readily tell within ten passengers the load on each car and record these numbers as the cars pass their station. From these figures, the figures in the column headed "Seats" and "Passengers" can easily be calculated.

The practice in checking traffic is to divide each period into periods of twenty minutes. Thus, in the example shown, there are three periods of twenty minutes each, from 10 p.m. to 11 p.m. The number of seats and the number of passengers in each twenty-minute period are tabulated on the blank line at the end of that period. In the first twenty-minute interval shown, there are 2,000 seats and 1,410 passengers.

In this form, the report is returned by the traffic checker to the office of the traffic department, when each period is marked with the words "Excess passengers per car" or "Excess seats per car," as shown.

The cross-sectioning at the right-hand side of the sheet enables the traffic department to chart the load per train. These charted lines and all of the lettering at the right-hand side of the chart are put on in the traffic department, while the figures at the left side of the report are put in by traffic checker.

The traffic checker enters these figures in pencil with his sheet attached to a board and a watch exposed so that he can easily get the time.

Mr. Doherty Puts It Up to Toledo

In Correspondence with the City Council of Toledo, Henry L. Doherty Points Out Advantages of a Larger Proportion of Ownership of the Local Railway by Toledo Residents—He Also Suggests the Railway Might Be Willing to Shut Down Temporarily to Give Buses a Fair Trial, if the Council So Desires

RAILWAY affairs in Toledo have not run so smoothly as was hoped when the Milner service-at-cost ordinance was adopted there some four years ago. This franchise permits a fare to cover operating expenses and a return on the investment, but does not forbid competition. Since the first of the year there has been an even more general discussion on traction matters. There were complaints in the City Council that the service was not adequate, that the fare was too high and that the service could be given perhaps better by buses. In the meantime, a franchise for 25 years for the operation of buses in a city-wide system was requested by the City-Wide Motor Coach Company. The charge was to be 5 cents, with a 1-cent charge for transfer.

Henry L. Doherty, speaking for the Community Traction Company, has made several offers to the authorities to help solve the question of better transit for Toledo. One was that the city employ an outside expert to make a transit survey and study, and he offered personally to finance such a study up to $25,000. A second suggestion, made about a month ago, was that the company issue an 8 per cent preferred stock to raise $2,000,000 for needed improvements. He agreed to take $500,000 of this stock if the citizens of Toledo would subscribe for $1,500,000. His purpose, as expressed in his letter, was to enlist the active participation of the representative citizens of Toledo in a comprehensive transportation system. According to his proposition the control and management of the property would be transferred to this group of new stockholders. Neither the Board of Street Railway Control nor the City Council, however, was in favor of either of these plans.

MR. DOHERTY REPLIES TO THE COUNCIL

Mr. Doherty's reply, which brings the situation up to date, was sent on May 29. After explaining that he would much prefer to make a personal presentation, but was not able because of his business affairs, he outlines his reasons for his suggestion that the control of the company be taken over by Toledo citizens and gives some of the reasons why better results had not been obtained from the service-at-cost franchise. In the first part of his letter he quotes from another letter, written by him recently to Mr. Goodwillie of the Board of Street Railway Control. This letter, slightly abstracted, follows:

ABSTRACT OF LETTER FROM MR. DOHERTY TO MR. GOODWILLIE

I read in the Toledo papers the report of the Board of Street Railway Control. I cannot concur in many of the statements made in that report, but I am not writing you this letter in your official capacity but merely as a brother engineer.

It has always been my contention that there is no excuse for engineers to disagree on any of the matters they are expected to know about, and also that engineers should be able to disagree with each other without giving offense and be able to sit down and talk things over until an agreement is reached.

I think practically everybody in Toledo is inclined to deal with this street railway matter as opportunists, and many of the things proposed would make it impossible ever to have a proper transportation system for the city of Toledo.

I hold:

1. That Toledo must have a comprehensive transportation system.
2. That this system must have a credit that will permit it to secure capital to enable it to keep pace or even anticipate the growth of the city.
3. To command capital it must operate at a profit and be reasonably free from jeopardy.

Therefore if Toledo must have a transportation system, and this system must have credit, then the citizens of Toledo should be willing to do whatever is necessary to create these conditions, and having done so there is no reason why the preferred stock of the company should not be both a sound and an attractive investment.

Let us assume for the moment that your water company was privately owned rather than municipally owned. What would the city gain or lose by compelling the company to work under conditions which made it impossible to earn a profit? The water company under this condition would be robbed of all credit and would be unable to raise the funds necessary to extend its mains or to enlarge its facilities from time to time as the city grew.

While we are operating a few one-man cars we are able to do this only by sufferance and the city has forbidden us

> to use one-man cars, which is one of the most effective methods of reducing railway costs.
>
> In my letter of the 5th to the Mayor I proposed turning over control to a group of Toledo citizens and wanted to make that group so representative that it would carry universal public confidence. If this group of men can get the co-operation of the City Council and the citizens, there can then be no question of the soundness of the investment.
>
> Your suggestion that new capital should have priority over the present bonded indebtedness is, I think you will admit, under the plan I proposed, eminently unsound. I proposed to turn over the control and management of the street railway company to Toledo citizens on the theory that they would be owners of the equity. If they put their money into the company as a lien ahead of the present bonds they would merely become creditors—and certainly neither you nor any other sound business man would advocate the control and operation of a company by creditors, when their investment would not be jeopardized by bad management or anything else, until junior capital to the extent of four or five times their obligation had been wiped out. An equity holder must operate a property in the interest of all the security holders, and it is only the equity owners of a property who can be reasonably expected to have the interest necessary for the control and management of a property.
>
> You say the service must be improved. This will require a rearrangement of the system and new capital. At the time when this should have been done the city refused to act, and some who opposed this action were prompted to do so because the owners of the road would receive an 8 per cent preferred stock for the capital they would advance. Now we are told that this same stock is not a sufficiently sound or attractive investment for the citizens of Toledo.
>
> You speak of its being necessary to lower the fares. Except as this is done by increasing patronage and reducing operating expenses, a rearrangement and an extension of the system, requiring still more capital, it means wiping out all earnings in excess of operating expenses, and I am inclined to think that a rate of fare might be insisted upon that would even leave an operating deficit. If the fare was lowered to the point where there were no earnings left for either bond interest or dividends on stock it would not reduce the fare by even a single penny.
>
> If the road can earn nothing for its owners, what incentive can there be for anybody to furnish new capital that you say should be provided for "adequately extending the service"?
>
> If our operations have been faulty and the fare has reached the present point due in any way to us, then this is at least answered for the future when we offer to turn over the management of the road to a representative group of Toledo citizens if they will join us in providing the capital required to give a proper and adequate transportation system.
>
> I think you will agree with me that Toledo could not possibly depend entirely upon buses for her transportation system and that Toledo must have a street railway system. It is true that the operating costs per mile for a bus is less than for a street railway, but it is also true that when traffic is heavy the cost of carrying the passenger is much greater with a bus than with a street railway system. It is also true that where the traffic is very light, and at the hours of the day when few people are riding, it costs more to drag around a big street car than it does a lighter bus. The best system available today is one in which the street cars are used as far as possible to handle the heavy and dense traffic and buses for other traffic. The buses should be entirely supplemental to the street railway system and not in competition therewith. What buses are operated should be operated by the Community Traction Company, and if the Community Traction Company is controlled by the representative citizens of Toledo, it seems to me that this should be the greatest insurance to the citizens of Toledo that they will receive a transportation service as good as it can be made and at the lowest possible cost.
>
> If nothing is done at this time it simply means putting off the doing of something that must sooner or later be done. Toledo must have a transportation system and that system must have credit, and that means that it must operate at a profit. Anything less than this means the continuation of unsatisfactory conditions and higher expenses for transportation service rather than lower expenses. A system without credit cannot function and must periodically be resuscitated to save it from collapse.

RAILWAY WILLING TO PERMIT TRIAL OF BUS

After quoting from his letter to Mr. Goodwillie, Mr. Doherty continued in his letter to the City Council that both of the suggestions made by him—that of the study by an outside transportation expert, and a representative group of citizens take over the property—were prompted by a belief that possibly the gravity of the situation, from the standpoint of its bearing on the welfare of the city, was not entirely appreciated by the citizens. He said he was also convinced that whoever furnished the local service must, to do so satisfactorily, furnish the entire surface and be free from competition. Continuing, he said he noticed that two bus concerns claimed to be willing to furnish a complete city transportation bus service on a 5-cent fare, but if the Council believed this possible, or if any large element of the people of Toledo believed this possible, he feared it would be an effectual barrier to any arrangement the Community Traction Company might offer that would solve the problem. Before it can accomplish anything, therefore, these bus claims must be tested and disposed of in advance. Continuing, he said:

> If you believe the city of Toledo can be served best and most economically exclusively with buses, we will agree that you should give a bus franchise to any concern you may select, and when it is ready to start operation we will suspend the operation of our cars, based upon an agreement that if the bus operations fail then they shall be ousted from the streets and we shall be given the right to resume the operation of our railway system with supplemental bus operations and without being subjected to competition, the decision as to whether the bus operations are more satisfactory and more economical than the system we propose to be determined by some tribunal mutually agreed upon. This is such a huge experiment and on such a gigantic scale that I hope it will not have to be resorted to, and I hope we can convince not only your honorable body but everybody in Toledo that the plan we recommend of a combination, co-ordinated, non-competitive transportation system made up of street railroad and bus is best for the city.
>
> There is a vast difference between giving a transportation service and merely carrying passengers at such times and on such routes and hours when and where it can be profitably done. While most cities have recognized the folly of competitive transportation lines, nevertheless in many cities buses are allowed to operate in competition with the street railway company, yet they only operate when and where it is profitable to carry passengers and leave the street railway company to operate its cars throughout the balance of the city and the remaining hours of the day and night, even though for fifteen or sixteen hours of this period the cars are compelled to operate at a loss. We certainly intend to give this much-desired service for twenty-four hours a day just so long as it is possible, but our only recourse to protect ourselves from loss against bus competition will be to suspend operation of cars during the unprofitable hours.

After making this proposition, Mr. Doherty said that the position of the Board of Control and of the City Council seemed all in the direction of having the company bear the entire burden and make all of the sacrifices to enable these bodies to secure for the people of Toledo what they think the city should have. Nevertheless, the company is willing to make certain concessions. For instance, it would reduce the amount which the company was entitled to charge to its sinking fund to $100,000 per year, with the proviso that for every 1 mill reduction in fares, the sinking fund would be increased by, say, $10,000.

Essential Features of Modern Electric Car Truck Design*

A Discussion of the Functions of the Various Parts of the Modern Truck, Giving Reasons for the Present Typical Design — Development of the Car Truck from Early Types Up to the Present Single and Double Trucks in General Use

By Walter S. Adams
Designing Engineer the J. G. Brill Company, Philadelphia

DESIGN of electric railway car trucks naturally falls into a series of designs of the various constituent parts, with their correlation in such a manner that they function properly and efficiently. The major parts to be considered are the wheelbase, the frame, the bolster and transom, the spring system, the brake rigging and types of wheels and axles. These will be considered in turn.

The length of wheelbase is important. A long wheelbase contributes to the steady riding of a car. The length of wheelbase which can be used is entirely dependent upon the minimum curve over which the car must operate. When a long wheelbase truck operates around a short curve, the wheel flanges bind in the rail grooves and cause excessive flange and rail wear and ofttimes derailment. The diameter of the wheels is also a contributing factor to the length of the wheelbase. The smaller the diameter of the wheels the shorter are the binding points of the flanges in the rail grooves. In practice an 8-ft. wheelbase truck with 26-in. diameter wheels will negotiate a curve just about as freely as a 7-ft. 6-in. wheelbase truck with 33-in. wheels.

While the wheelbase is very important on four-wheel cars, it is not a problem when double trucks are considered unless the car body is narrow and would interfere with the proper radiation of the wheels on a curve. A good rule to follow is to make the length of the wheelbase on a pivotal truck at least equal to the gage of the track. Keeping the wheelbase on a pivotal truck within reasonable limits allows the truck centers under the car body to be increased, giving better support for the ends of the car. On high-speed cars, where step heights are not restricted, a liberal wheelbase should be provided as it contributes somewhat to better riding at high speeds.

STRONG SIDE FRAMES ARE NECESSARY

Truck frames are subject to great vertical stresses. They must support the car body and its load of passengers and transmit the starting torque of the motors and the braking stresses. Experience of the Brill company has shown that side frames of one-piece solid forgings without bolts or rivets to hold them together are the best type. They have outlasted other constructions such as cast steel, pressed steel, etc. A number of years ago pressed plate steel side frames were operated on electric and steam railways. Apparently they failed or the maintenance was too great, as there are comparatively few now in service.

The truck bolster supports the car body and partakes of the same vertical and transverse movement, but it is necessary for the bolster to turn with the truck when entering a curve. Center or pivot plates are used to allow the truck to turn in relation to the car body. These are usually made with a pocket for a lubricant and are arranged with renewable wear surfaces. Ball-bearing center plates have been used in some instances. They perform a very useful function in allowing easy turning of the truck on curves. On irregular straight track, however, where a certain amount of stability is desired to prevent the trucks from following the irregular line of the track, they have been found so sensitive as to be objectionable, allowing the car to nose from side to side. The truck bolster is confined between the truck transoms and it is desirable to restrict the movements to and from the transom to the smallest possible amount consistent with freedom for vertical and transverse movement. Wear plates have been used for many years for restricting the movement of the bolster in relation to the transom. The Brill company, however, uses what is termed a bolster guide in place of wear plates. This construction links the truck bolster to the transoms and allows a vertical and transverse movement but maintains a constant relation of the bolster away from the transoms. The pivot where these links are connected to the truck bolster is located above the bottom of the truck center plate. This prevents the bolster from tilting over when the brakes are applied or the motors accelerated. This tilting prevails quite frequently in constructions where wear plates are used. The bolster guide construction allows perfect vertical freedom for the springs to perform their function under all conditions of service. It provides what may be termed a floating bolster.

When the brakes are applied the trucks are pulled toward each other an amount equal to the extent of play between the truck bolster and the truck transom. The frictional contact between these parts prevents the bolster from having vertical freedom, without which there will be no spring action for absorbing the vibrations set up by metal wheels running on metal rails.

The object of the bolster guide construction is to avoid this condition and allow the springs to perform their proper function without frictional contact or interference between the truck bolster and the transoms of the truck frame. This device also reduces the amount of the air brake piston travel by eliminating the usual play between bolster and transoms.

BOTH COIL AND ELLIPTIC SPRINGS ARE USED

The usual spring system for city trucks includes coil springs over the journal boxes to cushion the truck frame and the suspended end of the motor. Their contribution to good riding is almost negligible. The car body is supported on plate springs under the truck bolster which are usually of a full or a semi-elliptic type. These springs must be made of sufficient capacity to carry the maximum passenger load that can be crowded into a car and requires a very strong construction. Springs that are made for carrying heavy loads do not give the best results when a car is lightly loaded, and as light loads prevail the greater portion of the day, a system of springs is to be desired that will allow just as easy riding with a light load as with a heavy load. Such a system consists of a coil spring of limited capacity which is placed between the truck bolster and the plate spring referred to. Locating this coil spring between the plate spring and the car body allows it to absorb all the vibrations that pass through the heavy plate springs. This coil spring continues to act until the car has a seated load. Any additional load causes the bolster to rest on the coil spring seat, thereby putting this spring out of action. It remains out of action until the load is reduced, after which it again functions to give easy riding when the car is lightly loaded.

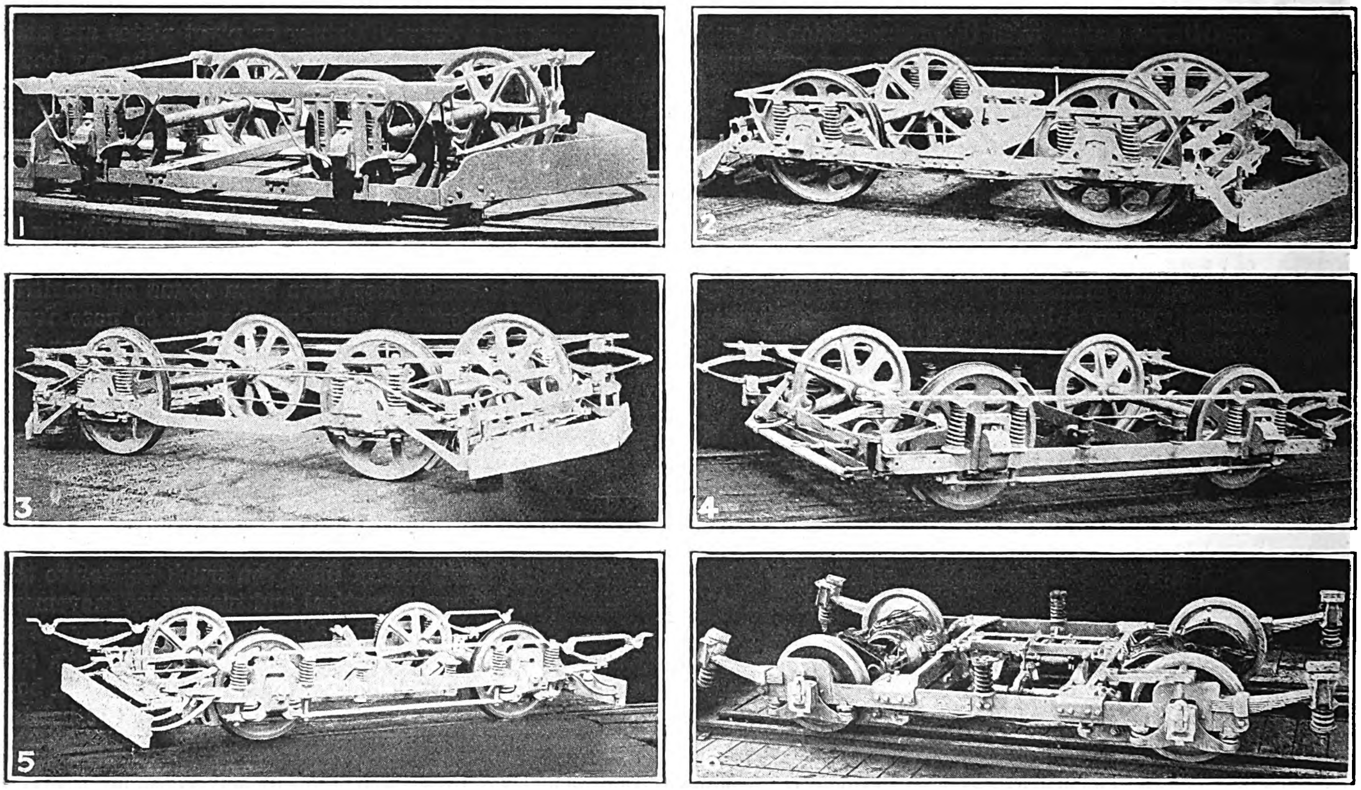
---

*Based on a lecture before the educational conference of the Boston Elevated Railway.

Somewhat associated with the spring system is the provision for allowing side easement of the car body when rounding curves or running on irregular track. This usually takes the form of links, one end supported on the truck frame, the other end indirectly connected to the truck bolster. These links cushion the side movement of the body. When a car enters a curve the trucks follow the rail, while the tendency of the car body is to continue on a straight line. The swing links allow the car body to be drawn back gradually to its normal relation to the truck. This is because as the links swing the car body is slightly raised. The weight of the car, therefore, acts in such a way as to restrict the swing of the links.

METHODS OF SUPPORTING BRAKE RIGGING

Brake design up to the present time provides for the use of metal brake shoes applied against the wheels. The combined pressure of all the shoes against the wheels approximates the weight of the complete car. To obtain this pressure a system of levers is used on the trucks in connection with levers on the car body. The pressure is approximately equal on all wheels except when maximum traction trucks are used, in which case the levers are arranged to give a pressure proportionate to the weight carried on the respective wheels. One of the problems in reference to brakes is to design a proper method of supporting the brake rigging from the truck frame. For many years a plain link and pin have been used for this purpose. However, as soon as a little wear occurs they become noisy and chatter. A number of different designs have been used to prevent noise and reduce maintenance.



Representative Types of Electric Railway Trucks for Single-Truck Cars

No. 1. First electric truck, type No. 1, placed in service in 1888.
No. 2. Truck with axle box frames, type No. 7, for four-wheel cars, 1889.
No. 3. Elliptical springs used at extreme ends of frame, type No. 13, 1890.
No. 4. First solid-forged frame truck, type No. 21, 1892.
No. 5. Another solid-forged frame design, type No. 21-E, for four-wheel cars, 1896.
No. 6. Late design, with solid forged frame, for single-truck cars, type 79-E, 1924.

The first design of axles for electric trucks had the check plate journal. This type of journal was used on practically all horse-car running gear. The check plate fitted into a groove in the journal and held the journal in close relation to the journal box. This was a desirable feature in view of the dust guard arrangement used in the journal boxes at that time.

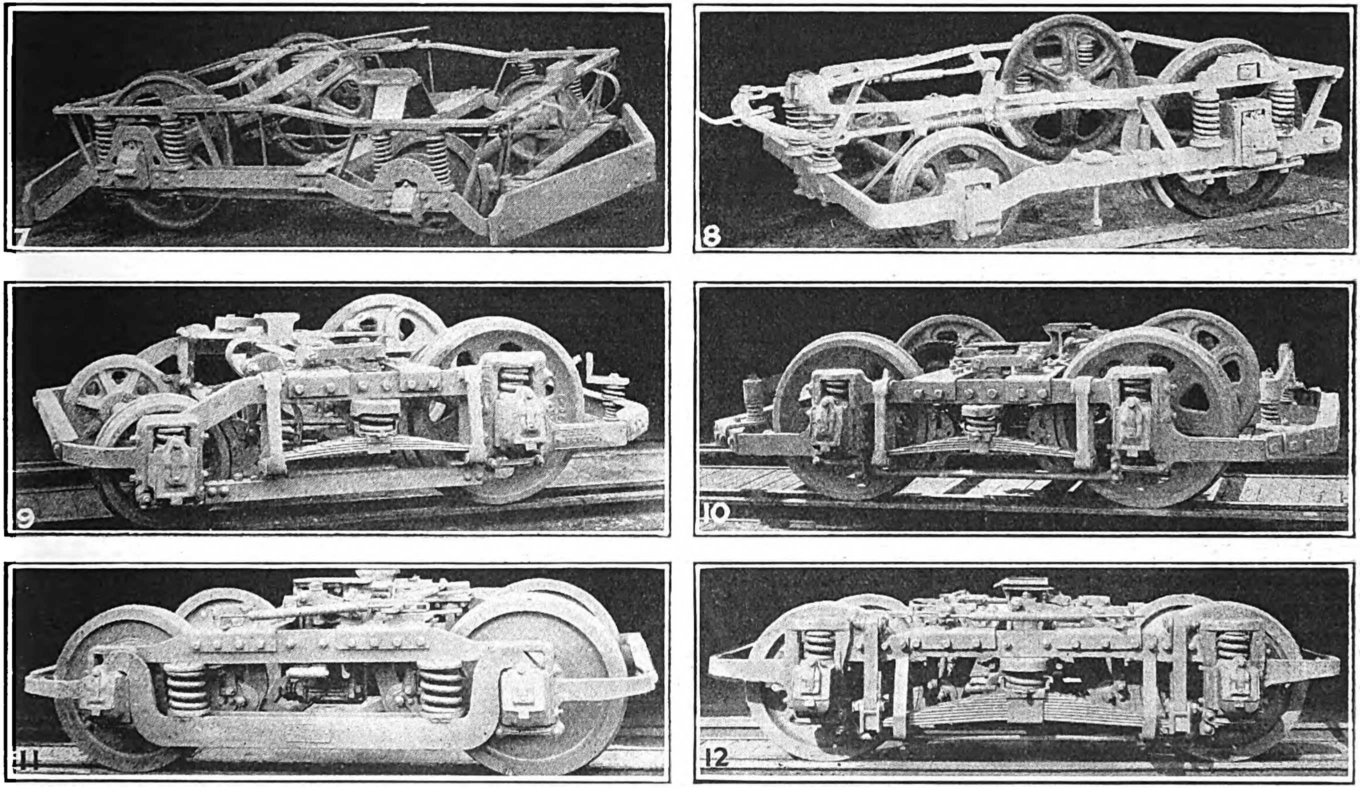
As the speed and weight of cars increased, it was found necessary to use the same design of journal as on steam railroads. This has a button on the outside end of the journal and a shoulder on the inside end. Another type of journal that is used to a limited extent is a collarless journal. With this type the end of the bearing or the journal wedge extends down over the end of the journal to restrict the end play.

The Master Car Builders' type of journal and journal box, which is now used almost exclusively, is one of the American Electric Railway Engineering Association standards. It allows considerable end play of the journal. This is not objectionable if the rails are in good alignment, but when rails are not in good condition this end play contributes to the side swaying of the car. The combined end play of the axle from one extreme to the other approximates ½ in. However, if thrust plates are used as provided for in the A.E.R.E.A. standards, this end play can be reduced.

For electric railway service wheels are pressed on axles with a pressure which approximates 10 tons per inch of diameter of the bore. There is a tendency to reduce this amount of pressure as being unnecessary. Lower pressures have been found to hold the wheels tightly.

Ball and roller journal bearings have been so successful on gas motor trucks and pleasure cars that there have been repeated efforts to operate them successfully on electric cars. Automobiles have rubber cushion wheels which relieve the ball and roller bearings from road shocks and this, no doubt, contributes to their success in these vehicles. Where they have been installed on electric cars without any cushioning to relieve the metallic shocks between wheel and rail they have in large measure failed.

The Brill company has been using a rubber-cushioned steel-tired wheel on gasoline rail cars for nearly three years. These cars are equipped with roller bearing journals that have been very successful. This success can be attributed to the rubber cushion which insulates the wheel and rail contact from these bearings. Not only does this cushion wheel help the roller bearing but it also reduces the wear of the flange, as the rubber cushion is so installed that it allows horizontal as well as vertical cushioning. Many of these cushion wheels have a record of continuous service in excess of 110,000 miles.



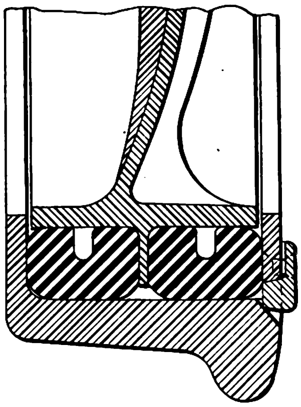
Types of Trucks Used for Double-Truck Cars

No. 7. First maximum traction truck, type No. 11, 1891.
No. 8. Maximum traction truck with solid-forged frame, type No. 11, 1892.
No. 9. Single motor pivotal truck, type No. 39-E, 1924.
No. 10. Bolster guide-spring system and solid-forged frame, type No. 76-E, 1924.
No. 11. Designed for high-speed service, type No. 27, MCB.
No. 12. Twin swing links, solid forged frame, type No. 77-E.

DEVELOPMENT OF THE SINGLE TRUCK

The first successful electric trucks for four-wheel cars were made more than 37 years ago. At first, with the use of electricity as motive power, they were simply modifications of horse car running gears with motor equipment hung upon the car body. In 1887 John A. Brill, the youngest son of the founder of the J. G. Brill Company, invented what is recognized as the first system of electric car trucks in which the truck frames supporting the motors, brakes, etc., were independent of the car body. This development permitted railways to keep their motor and truck equipment in service the year round, as trucks and motors could be removed from under closed cars and installed under open cars, and vice versa. These first trucks were of the cast pedestal type and had a unique system of springs. Instead of two or three pairs of springs, combining both coil and plate types as are used in most modern trucks, the entire spring action was provided by one set of coil springs arranged so that two coil springs were located at the sides of the journal box under the car body attachment frames. The entire brake rigging was supported on this set of springs. As the brake shoes were subject to the action of the springs it required considerable lever movement to bring the brake shoes against the wheels when the car body was loaded.

Subsequently, trucks were designed with axle box frames which rested on rubber cushions on the journal boxes. This practically rigid frame carried the brakes and free ends of the motors so that the coil spring system between the frame and the car body supported the latter only. This improved method not only eliminated the objectionable feature of excess slack in the brake rigging when the car body was loaded but also minimized the vibrations set up in the body by brake applications. In those days electric cars and trucks were short. As longer car bodies came into use there was more body overhang outside the wheels. This resulted in excessive end-to-end oscillation. To overcome this difficulty, truck frames were extended and elliptical springs were installed on the extreme ends of the frame to function in connection with the coil springs on both sides of the journal boxes. This combination of coil and plate springs, working together, increased the stability of the car body and resulted in improved riding action. Plate springs, of course, are retarded in their action by friction between the plates, whereas the coil spring is not restrained by any friction. Consequently it is quicker in its action.



Rubber-Cushioned Steel-Tired Wheel for Gasoline Rail Cars

The original axle box frames were formed of a number of parts bolted or riveted together. The severe condition of service to which these frames were subjected caused the bolts and rivets to work loose, requiring considerable attention to keep them in a serviceable condition. As early as 1892 the practice of making truck frames of solid forgings was introduced. This practice has been continued by the Brill company. With few exceptions this company uses forged truck frames exclusively. These were at first made under heavy steam hammers, but today they are produced on a set of specially installed hydraulic presses which range from 300 to 3,000 tons capacity.

Double Trucks Needed for Long, Heavy Cars

As car bodies were increased in length and weight they went beyond the limits of the ordinary four-wheel single truck, making it necessary to use double trucks, the first of which were the maximum traction type. At first this type of truck, with only one motor, was used in connection with large driver wheels and small pony or guiding wheels. The car body was supported at the side of the truck without the use of a bolster on the car body or on the truck.

One of the principal advantages of this type of truck was that it would curve between the long side steps on cross seat open cars, which were popular at that time. This was accomplished by locating the pivoting point on the truck close to the driving axle, reducing the radiation of the driving wheels so they would not interfere with the car sills or steps. On the trail end of the truck where radiation was increased small wheels were used so they could swing below the steps. This was the only type of truck that could be used interchangeably under long open cars and closed cars. This truck also permitted step heights to remain almost as low as on the smaller single-truck cars. The use of small pony wheels, as well as the single-motor feature, eliminated considerable weight. This type of truck did not have any mechanical center plate, but was guided in curving by angle plates bolted to the side sills of the car and a traveling kingbolt attached to a cross member of the car body. This type of truck, which was introduced as early as 1891, is still being produced.

The tendency toward heavy cars, particularly in cities with steep grades or hilly country outside of cities, made necessary the development of trucks having wheels of equal size and the use of quadruple-motor equipment. When the general reaction came toward smaller and lighter units of the Birney safety car type, the public, accustomed to the steadier riding double-truck cars, required a truck which would give the maximum amount of stability. This led to the development of a truck that carried practically all the weight on the extended spring base, still maintaining, however, the combination of plate and coil springs to obtain the most desirable riding qualities.

Accidents Decrease in St. Louis

DURING the twelve-month period ended March 31, 1925, the United Railways of St. Louis made a reduction of 5,642 accidents over the previous twelve months. The detailed figures follow:

ACCIDENTS FOR TWELVE MONTHS ENDED MARCH 31, 1925
UNITED RAILWAYS OF ST. LOUIS

	1925	1924	Per Cent Decrease
Collisions with vehicles	525	762	31.2
Collisions with persons	564	695	18.8
Collisions with animals	53	83	35.4
Collisions with motor vehicles	11.311	12,968	12.8
Car collisions	325	541	39.9
Car derailments	147	327	55.0
Boarding and alighting	2,140	2,541	15.8
Falls in car	885	880	.5*
Disturbances	609	936	45.6
Car equipment	45	190	76.3
Miscellaneous	2 041	3,877	47.3
Employees injured	130	210	38.1
Power plant	192	248	22.6
Maintenance of way	545	662	17.7
Shops and sheds	321	380	15.5
Electrolysis	38	41	7.3
Struck by doors	398	570	30.2

* Represents increase.

This is in spite of the fact that highway accidents of all kinds in St. Louis, as reported by the police department, increased 14.4 per cent and the automobile registration increased approximately 20 per cent.

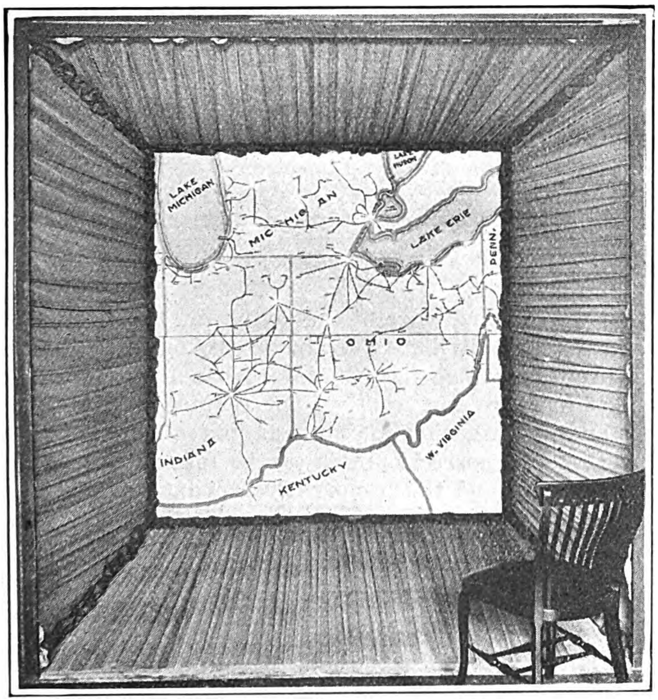
These results, according to an article by E. J. Eastham, safety director United Railways of St. Louis, in the last issue of the *National Safety News*, may be attributed largely to a safety committee, representing all the departments of the company, appointed in February, 1924. A feature of the work carried on by this committee is the award of a prize each month to the carhouse having the best record as regards safety. To visualize the day by day accident records, a large wooden dial with two movable hands, one red and the other black, was installed in each carhouse. Each day the carhouse foreman sets these hands on the dial so that the red hand points to the total number of accidents for the cars from that carhouse up to that day of the month, while the black hand shows the corresponding total for the same month of the previous year. The slogan is, "Keep the red hand back."

The dials are so placed as to attract the attention of every employee coming into the carhouse before taking his car out, and to show him at a glance just how his division stands on accident reduction for the month to date.

Large Electrified Map Attracts Shippers

Through Routing in Central District Shown on Large Electrically Lighted Map Exhibited at Indiana Dealers' Convention of J. R. Watkins Company

BELIEVING that an ounce of exhibition is worth a pound of talk, the jointly maintained public relations department of the Indiana, Columbus & Eastern and the Columbus, Newark & Zanesville Railways has prepared a map 8 ft. square of the traction lines of Ohio, Indiana and Michigan, and displayed it before the Indiana dealers' convention of the J. R. Watkins Company, large manufacturer and distributor of household commodities, held in Indianapolis on April 10. W. R. Huffer, general agent for the companies, who designed the map, was featured on the program under the heading of an address on "The Speed of Express at the Cost of Freight."



Map Used to Show Availability of Traction Lines

The map was constructed of beaverboard and mounted in a purple cloth-covered beveled frame with orange borders. It presents an attractive appearance. The various cities are indicated by small electric bulbs screwed into the face of the board with the wiring on the back, the traction routes being shown by broad red lines.

As the J. R. Watkins Company distributes direct from its nine branches through more than 5,500 sales people to consumers, any display of prompt and convenient methods of routing made to these men would be highly profitable. Moreover, since the branch that supplies the Indiana territory is located in Columbus, the I., C. & E. and the C., N. & Z are in a position to move much of this material.

Here the policy of selling electric transportation as a whole, instead of playing up a particular line exclusively, has proved its value. The shipper is not interested in any particular traction line. His interest is in reaching the points he desires.

Another interesting phase of the map's career was its display before classes in transportation and advertising at the Ohio State University. On this occasion Mr. Huffer made an address on traction transportation, in which he brought out the quality of initiative and spirit of service that distinguishes the industry. This display was made in connection with a project for advertising in the University Year Book by which the students in advertising classes entered a contest in writing the copy, a prize being awarded by the railway for the best advertising suggestion submitted.

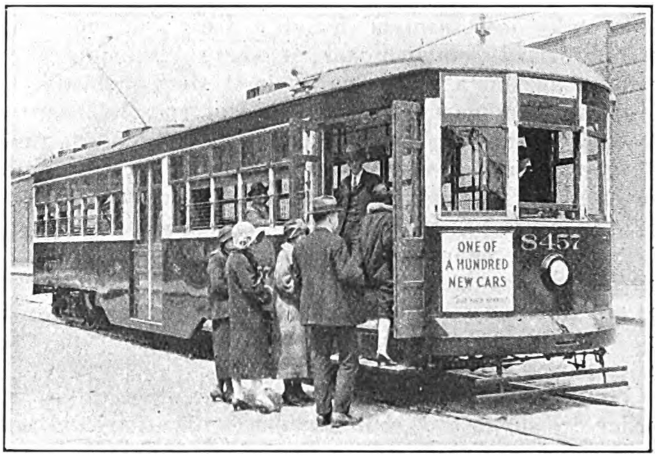
Advertising Increased Service in Philadelphia

IN ITS recent publicity material, the Philadelphia Rapid Transit Company has been emphasizing its efforts to meet the demands of its patrons for more and better service. It feels that its patrons prefer this course to a possibly slightly lower fare with poor service.

During April and May, the company's car leaflet "Service Talks" contains the following statement in every issue: "P.R.T. is constantly striving by every means at its command to make its service more adequately meet your needs. When we fall short, we appreciate receiving from you information specific enough to enable us to correct the fault. Address your suggestions to: Service Talks, 1520 Spruce Street."

Company car cards emphasized that patrons were getting more service, as by reading "More Service on This Route," or "This New Car Which Helps Improve Your Service Is Possible Because of the Present Fare."

When the company bought 100 new cars recently from the J. G. Brill Company, each car carried a dash card, "One of a Hundred New Cars for Your Service." The accompanying illustration shows its appearance.



Philadelphia Advertises Additional Service by Dash Signs

These new cars are the P.R.T. standard one-man two-man cars, with front entrance and center exit. They differ from the previous Philadelphia standard only in the fact that the width of the front door has been increased 3 in., making it 5 ft. 1 in. in the new cars.

Honeycomb Ventilators on Third Avenue Cars

In the article describing the new cars of the Third Avenue Railway, published in the June 6 issue of ELECTRIC RAILWAY JOURNAL, a misstatement was made as to the type of ventilators used. These are Railway Utility Company's "Honeycomb" type with lighting fixtures.

The Readers' Forum

Comments on Interurban Consolidation

AMERICAN ELECTRIC RAILWAY ASSOCIATION
NEW YORK, June 10, 1925.

To the Editor:

I have been much impressed with the receipt of the suggestion made at the Central Electric Railway Association meeting for consolidation of the facilities of the interurbans. Co-operative effort on the part of the carriers cannot help but be of great benefit in this respect, as in all other branches of the transportation utility service.

L. S. STORRS,
Managing Director American Electric Railway Association.

HENRY L. DOHERTY & COMPANY
NEW YORK, June 9, 1925.

To the Editor:

The suggestion made by John A. Beeler before the Central Electric Railway Association at French Lick that the interurbans in the central territory should be consolidated is certainly a good one. As a group of individual, comparatively small properties, their situation is difficult. The short-haul travel has in most cases nearly vanished. Long-haul business in which several properties participate has been developed only in small degree, largely because of the difficulties, as found in any line of business, of having so many parties to the agreements necessary with respect to service, operating practices, equipment and the apportionment of revenue and expense.

It really does seem as though a great step would be made toward establishment of these interconnecting interurbans on a profitable basis if they could all be brought together under some plan of consolidation or lease by a holding company and operated as a unit. Shippers would surely be attracted to do business with an electric railroad system of such extent, where it is hard to interest them with the present difficulties of such frequent interchange and the multi-division of responsibility among six or seven properties. I would like to see this consolidation made effective, as I believe it offers the most promising possibility of restoring the interurbans to a sound position.

While we are discussing this subject it might be in order to suggest a still broader unification and coordination of transportation facilities. Why not gather into one huge system all the bus and truck operations in Indiana and Ohio, together with the interurbans, utilizing each where it is most effective and in a way to contribute to the prosperity of the others? This is extending the principle that the city railway should provide all the public transportation in the city to apply to the state as well. The opportunity for doing so on such a large scale is more or less peculiar to these two states. But I believe it is worth thinking about here.

FRANK R. COATES,
President Central Electric Railway Association.

INDIANAPOLIS, IND., June 8, 1925.

To the Editor:

You ask my views concerning the consolidation of central interurban railways as suggested by Mr. Beeler at the Central Electric Railway Association meeting. I did not understand him to present a "plan," but only general suggestions as to advantages of such consolidation. Such consolidation would have to receive the approval of the public service commission of each state interested and also the approval of the interstate commerce commission. I consider any views I might give of no value, for they could be valuable only if based upon something that has been carefully considered and carefully worked out.

Many of the things mentioned by Mr. Beeler as desirable have already been accomplished and others are being accomplished by the association through its transportation and traffic departments. It may well be doubted whether a consolidation would be desirable if attained. Many may think more would be lost by disturbing the present friendly public relation than would be gained by a consolidation. Whatever might finally be the result of an effort for such consolidation, there certainly is nothing concrete before us now, and my judgment is that the present is not an opportune time for a discussion of the suggestion.

CHARLES L. HENRY,
President Indianapolis & Cincinnati Traction Company.

ANDERSON, IND., June 8, 1925.

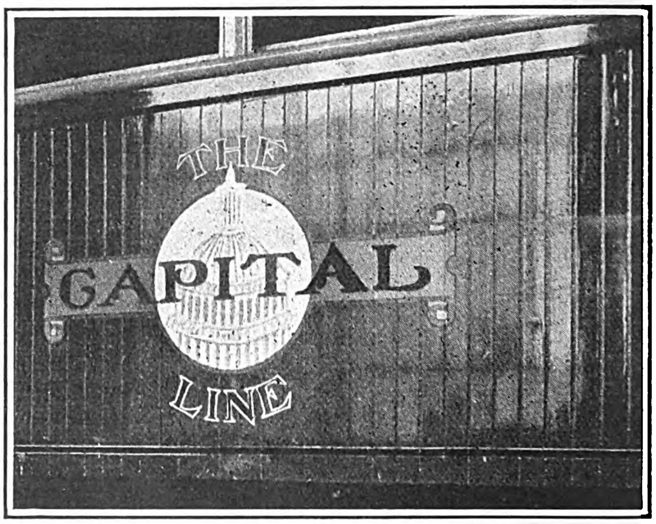
To the Editor:

Answering your wire of the sixth, Mr. Beeler's paper is a valuable contribution to the discussion of the pressing problems which face the interurban industry. The suggestions are constructive, but require careful analysis and investigation and must assume a more concrete form before a correct opinion can be formed as to their practicability and the comparative advantages and disadvantages of the solution proposed.

ARTHUR W. BRADY,
President Indianapolis & Cincinnati Traction Company.

W., B. & A. Becomes "The Capital Line"

THINKING that it would have an advantageous advertising effect, the Washington, Baltimore & Annapolis Electric Railroad has decided to change the color of its cars from Pullman green to traction orange. At the same time a device representing the dome of the United States Capitol at Washington and carrying the words "The Capital Line" is being painted in the center of the side sheathing of the cars. The particular significance of this name lies in the fact that the railway connects Washington, the capital of the United States, with Annapolis, the capital of Maryland.



This Device Is Being Painted in Colors on the Sides of the Cars of the W., B. & A. Electric Railroad

Association News & Discussions

Interurban Consolidation and Car Design Topics at C. E. R. A. Summer Meeting

Methods of Building Business and Development of Automatic Substations Also Considered at Three Well-Attended Sessions—Progress Made by Pittsburgh Railways Described—Lively Discussions Indicate Trend of Thought

MORE than 300 members and guests of the Central Electric Railway Association attended the summer meeting at French Lick Springs, Ind., on June 2-4. Despite two inviting golf courses and unusually warm weather, business meetings were characterized by fine attendance and carefully prepared papers and discussion of a wide range of subjects particularly important to the roads in the central territory at this time.

As expressed by President Frank R. Coates, the association was signally honored in having for its first speaker Lucius S. Storrs, managing director American Electric Railway Association. An abstract of Mr. Storrs' address appears on a following page of this issue.

Several other deeply significant papers followed. Under the title "A Major Operation on the Interurban," John A. Beeler, consulting engineer, New York City, advocated consolidation of the various connecting railways in the central territory for the purpose of effecting operating economies and building a more efficient electric transportation system to attract long-haul passenger and freight business. F. L. Blanchard, director of public relations Henry L. Doherty & Company, advocated a more general and more intensive use of advertising in all forms for building up a greater volume of electric railway business.

One entire session was devoted to the subject of power and its distribution. G. H. Kelsay, superintendent power and equipment, Cleveland Southwestern Railway & Light Company, outlined the trend of practice with reference to railway power systems. C. H. Jones, electrical engineer Chicago, North Shore & Milwaukee Railroad and Chicago Rapid Transit Company, spoke on automatic substation performance. L. D. Bale, superintendent of substations Cleveland Railway, described the results obtained from several years' experience with automatic stations on a strictly city distribution system. This power session was further enlivened by discussions from Allan J. Smith, superintendent of power Columbus Railway Power & Light Company, and C. C. Argabrite, electrical engineer Interstate Public Service Company.

Other papers included one on style in car design by Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL; a paper on car construction problems by J. A. Greig, editor *Electric Traction* and read by C. L. Van Auken, and a description of the steps taken by the Pittsburgh Railways for winning the confidence of the public, by Thomas Fitzgerald, vice-president of that property. The paper on style in car design, and a written discussion prepared by G. L. Kippenberger, assistant general manager St. Louis Car Company, are abstracted on another page. This general topic was also discussed by Thomas Elliot, vice-president Cincinnati Car Company.

On the subject of railway power systems, Mr. Kelsay compared conditions which are encountered in taking power supply from large interconnected systems with the former simple transmission line having comparatively small total connected power. He called attention to the reasons for the greater strain which is thrown on protective devices, and showed why it is necessary for modern circuit breakers to be scientifically selected and carefully adjusted to open in proper sequence under sudden overloads, so as to avoid disturbing the entire interconnected distribution system when this is supplied by several plants.

LINE LOSSES REDUCED BY CLOSER SPACING OF SUBSTATIONS

In his talk on automatic substation performance, Mr. Jones presented some interesting experience data accumulated by the North Shore Line over a period of years, and showing the degree of reliability which has been reached in automatic apparatus design. Of the seventeen substations in service on the North Shore property, ten are automatic and seven are manually operated. The total connected substation capacity is 19,000 kw. The largest single units in use are 1,500-kw. machines. An original substation spacing of 13 miles has been cut down to 6½ miles by installing intermediate automatic stations. This process of placing converting units at closer intervals along the line is again being repeated so that an ultimate spacing of 3¼ miles between conversion units will be obtained. Experience obtained over a number of years with automatic equipment has, according to Mr. Jones, demonstrated the advisability of reducing substation spacing to reduce line losses. With the longer spacing these were about 25 per cent, while with the 6½-mile spacing they were reduced to between 10 and 12 per cent.

During a period of eight years a careful record of performance has been maintained. Eight automatic stations have operated a total of 217,000 station-hours. The total d.c. output of these stations was 60,500,000 kw.-hr. and there were 305,000 complete starting and stopping cycles. One station installed in 1917 with a 500-kw. unit has made 77,000 complete operating cycles. These records, Mr. Jones pointed out, indicate the reliability of the apparatus used in even the early stations. He said that later stations have been improved, however, and cited the experience with a recently installed station of 2,000-kw. units, where the output during a year had been 7,000,000 kw.-hr. with practically no failures.

Experience on the North Shore Line includes both 25 and 60-cycle apparatus. There was consequently a period of change-over, which increased the likelihood of failures, but despite this condition, the average failures were one per 1,000 operations during the period of change and development. At present failures are extremely rare after the stations are once properly installed and adjusted. Careful records of repairs and maintenance show this item to be very small.

Buildings originally installed for automatic stations were very simple and small in size. There has been some development in practice as experience has been gained. When high-tension apparatus was first installed outside, the buildings were in some cases made extremely small. The savings in construction cost did not warrant this practice, and larger buildings are now being used. Recent substation buildings have inside floor dimensions of 35 x 26 ft., with an inside ceiling height of 15 ft. This size building is now considered sufficient for units up to 2,000 kw. Mr. Jones said that dissipation of heat from the machinery is a real problem, so that building ventilation was of extreme importance. He called attention to the reports of the power generation and conversion committee of the American Electric Railway Engineering Association and pointed out that they give much valuable information on this subject, which may well be studied by any property contemplating the installation of automatic substations.

AUTOMATIC SUBSTATIONS FOR CITY SERVICE

Mr. Bale told of experience with automatic stations on a city system. He said that the Cleveland Railway went to automatic stations about five years ago and is using them both for supplying extensions of lines to outlying territory and for additional power requirements in congested sections of the business district.

Two 1,500-kw. units were used in the first station installed. There now are eight automatic stations in service, having a rated capacity of 18,000 kw., and two additional stations of 3,000-kw. capacity each are now under construction. Machines of 1,500-kw. rating are standard, for the purpose of reducing the number of repair parts required for maintenance.

Although considerable redevelopment was necessary in some of the first stations due to the use of makeshift apparatus, subsequent experience has been satisfactory, and has shown that automatic apparatus can be used profitably in congested downtown business areas.

Buildings for the first three stations erected in Cleveland provided 45 cu.ft. for each kilowatt of installed capacity. In later stations, this building size has been reduced to 15½ cu.ft. per kilowatt. Buildings on some of the more recent installations have outside dimensions of 41 x 41 ft. Considerably more apparatus is required in a city station than in one for interurban service, thus affecting the size of building required to house it properly.

Mr. Bale discussed the relative advantages of shunt and compound windings for converters in city stations. He said that the Cleveland property had decided to retain compound-wound machines after a careful study, in order to effect the power savings from properly maintained trolley voltage. He pointed to the effect of synchronized traffic control on power requirements, due to the starting of many cars simultaneously at various points in the business district. In Cleveland, he explained, the increased power requirement for this simultaneous starting has increased the energy cost from $20,000 to $30,000 per year. Shunt-wound converters used under these conditions would have resulted in reduced voltage and would have increased this energy cost materially. Beside the actual cost of energy involved, he said that the retention of compound-wound rotaries had been further dictated by the need for maintaining trolley voltage which would permit rapid get-away and acceleration of many cars simultaneously in congested traffic in the business area. The savings in time resulting, he held, are even more important than the actual energy costs involved.

REMOTE CONTROL IN CLEVELAND

Another characteristic of Cleveland conditions, described by Mr. Bale, is the large proportion of feeder sections that are connected to two stations. Of all trolley sections, 86 per cent are connected in this way. Consequently, supervisory control of stations was considered desirable, so that a central load dispatcher could reroute or transfer load in the event of a distribution system failure. Under the arrangement installed, the dispatcher can shut down or start any station at will. He has a graphic record of the load on all automatic stations before him, and also knows the voltage conditions existing at various locations at all times. With the equipment provided, he can corelate the operation of the eight automatic stations during normal times and can make any shifts of load required during an emergency. Previous to the installation of the remote control system, the automatic stations did not show a favorable 24-hour over-all efficiency, due to the converters running too long in some of the automatic stations. Since the installation of the remote control, the previous over-all efficiency of 85 per cent from bus to bus on the automatic stations has been improved to 95½ per cent. Results accomplished with automatic stations, Mr. Bale said, have been so highly satisfactory that the remote control board has been laid out for all automatic operation ultimately. This will require approximately 30 automatic stations.

In discussing the financial advantages of automatic substations for city service, he said that there are many benefits obtained from such control which cannot be definitely evaluated in dollars and cents, but which are nevertheless very important. Among these he listed increased efficiency, higher continuity insurance, due to the elimination of the personal element of the operator, and reduced electrolysis.

Comparative maintenance costs of automatic and manual stations were presented on the basis of total cost per converter unit. Mr. Bale pointed out that this method of comparison was not entirely fair to the automatic station due to the larger number of parts that are installed per converter as compared with a manual station. The figures, however, were as given below, averaged over a period of one year:

AVERAGE MONTHLY COST OF CLEVELAND SUBSTATIONS

	Manual	Automatic
Number of stations...	5	8
Total rated capacity, kw.	33,000	18,000
Equipment maintenance, labor, material and superintendence	$146	$196
Buildings	219	270*
Operation, superintendence, inspection, etc.	362	184

*Includes maintenance of lawns, etc., used for decoration of automatic station grounds.

Of the eight automatic stations, five are almost new, which, he said, makes it likely that the maintenance account will be lower during the following year than during the period over which these figures were compiled. Mr. Bale added that one load dispatcher and helper are expected to be able to handle the entire remote control system when all stations have been changed over to automatic operation.

A. J. Smith agreed with the two previous speakers as to the reliability of automatic apparatus. He said that elimination of the personal element in switching was one of the most important advantages of automatic operation. In addition, he said that automatic switching apparatus handles emergencies faster and more reliably than can be expected from human operators. He maintained, however, that a higher grade of inspection personnel is required for automatic stations than usually is available for the maintenance of manual stations.

The relative energy economy of automatic and manual stations was compared by Mr. Argabrite, on the basis of a one-week test made on the lines of the Interstate Public Service Company. In this case, non-automatic operation of a station, running 24 hours per day, showed an energy consumption of 13,600 kw.-hr. at the a.c. side, while with full automatic operation of the same station, under traffic conditions that varied only by three cars for the week from the conditions under which the previous test had been run, the energy was reduced to only 11,050 kw.-hr. In a six months' test the efficiencies of his automatic substations from a.c. input to d.c. output ranged between 90.7 per cent and 92 per cent, while for corresponding manual stations the efficiencies were 81 to 84.8 per cent.

COMBINED RAIL AND HIGHWAY CAR PROPOSED

During the meeting, W. J. Seitz of Detroit described briefly a patented system of combined rail and highway operation which contemplates the use of a light-weight trail car equipped with an eccentric axle which will enable it to be changed quickly from rail to highway, where the cars are to be pulled by light tractors, so as to permit plant delivery of products without rehandling.

President Coates read a copy of a letter written by Henry L. Doherty to the City Council of Toledo relative to the transportation situation in that city. In this letter Mr. Doherty sought to show some of the reasons for transportation difficulties in Toledo. This correspondence is published elsewhere in this paper.

BUSINESS BUILDING METHODS

The subject of building up through business was discussed by W. S. Rodger, general traffic manager Detroit United Lines. He held that the heavy diversion of both passengers and freight to automotive vehicles for hauls up to 50 or 60 miles calls for serious consideration by both electric and steam lines. He pointed to the increased operation of mixed freight and passenger trains by the latter as an evidence of the effort being made by the steam roads to give faster freight service and at the same time bolster up the earnings of some of their passenger trains. He also called attention to the increasing use of motor trucks by the steam roads for improving short haul service.

In spite of the diversion of traffic from rail lines, the speaker maintained that there is a constantly increasing demand for both passenger and freight transportation service. The agency which in the long run furnishes the best and most dependable service at comparable cost, he held, ultimately will get this business. Since the rail lines start with the cost factor in their favor, improved service is the key to getting the traffic. "Make the time faster than the other fellow and then tell the world about it" was his summary of the method required.

In the development of through traffic he explained the advantage obtained by the building of spur tracks into carload shipping industries, and advocated making every inducement to get tracks into such plants. He also advocated close attention to getting industries located exclusively on electric railways, and suggested that electric railways, wherever possible, be properly equipped to handle standard steam road cars, if only in switching movements. He said that this would enable the roads to gain considerable traffic and in most cases would eventually lead to an interchange with the connecting steam roads.

On the same subject, F. D. Norveil, general freight and passenger agent Union Traction Company of Indiana, agreed with Mr. Beeler that the short haul transportation of both passengers and freight have been lost, except under certain conditions, by both the steam and electric lines. He therefore advocated concentration of effort on securing long haul traffic which cannot be successfully handled by automotive vehicles. "Much of the distant travel in what is known as Central Electric Traffic Association territory," he said, "can be attracted to the interurban lines by proper equipment and proper schedules. He added that the great industrial territory which is linked up by the network of interurban lines in the Central Association furnishes a secure foundation for building traffic, if consolidated operation is brought about to an extent which will enable a substantial improvement in service to be offered the shipper. Wherever the existing service has been properly organized, he maintained that the interurbans have established an enviable record of performance over hauls of 250 to 400 miles, which has been 50 per cent faster and more efficient than even the old line express companies have been able to render over the steam roads.

OTHER CONNECTING LINKS PROPOSED

Mr. Norveil suggested other connecting links which should be built to the existing lines in the territory, in addition to those suggested by Mr. Beeler. He also made a plea for the fullest possible co-operation by the various operating departments in so improving service to shippers that interurbans would inevitably receive the amount of business to which their potential shipping capacity entitled them.

Greater co-ordination of facilities and equipment as they exist today was held to be the greatest immediate problem of the lines in the Central territory by T. H. Stoffel, railway department, Westinghouse Electric & Manufacturing Company. He said there is much evidence that shippers generally appreciate the service which electric lines are rendering, but added that there is still much opportunity for bettering and improving the service and effecting economies in operation. Under existing conditions, costs are increased and the amount of interline freight movement is limited by the lack of proper and adequate freight stations and terminals, the almost total absence of accessible team tracks and sidings for loading and unloading freight and the development of straight carload tonnage, failure to install sidings at industrial plants to develop new business and reduce the handling through warehouses, and the inadequate supply of rolling stock for even normal requirements.

Bringing Back Prosperity to the Electric Railway Lines*

Prosperity Must Be Won Back by the Railway Men—Interstate Bus Regulation Must Come—Consolidation of Properties a Possible Solution

By Lucius S. Storrs

Managing Director American Electric Railway Association

DURING the last few days it has been my very great pleasure to visit various parts of your Middle Western country. Progress is the general keynote of your section, and yet among you the general conditions in our own industry are below the standard of other businesses. There doubtless are among you executives of properties which are suffering, particularly at this time, a feeling of discouragement. Temporarily, perhaps, it is justified. There may be properties that never will recover from the severe blows they are now receiving. But that the industry as a whole, or any great part of it, is doomed in this great heart of the Middle West, where scores of other businesses are going on to success, is unbelievable.

I base this statement on the very essentiality of our business. The majority of the public now is, and has been ever since our industry came into being, dependent on electric railway companies for transportation. That this demand for such a public service will continue is patent. Methods of providing transportation may change in certain details, but the mass of the people must continue to be served by a public service. Their rides must be provided and their commodities hauled. The organization best fitted to perform this service will be called upon to render it. We must and will remain that organization. Since in the long run service cannot be rendered without a fair profit, that profit must, of necessity, come too.

How soon that happy day will come depends, in a measure, on the willingness of the public, as represented by federal, state and local government officials, and ourselves to get together in a genuine spirit of co-operation. But most of all it depends upon ourselves. For we shall progress no faster than we make our problems plain to the public and show a readiness to work with its servants in bringing about solutions. On this also you may depend. For the most part our prosperity will not just come back. It will have to be won back, and we are the ones who will have to win it back.

Electric railways are rapidly absorbing scattering bus lines and creating new bus routes. This service rendered by electric lines has grown 129 per cent in the last year. More than 3,000 buses now are being operated in conjunction with electric cars.

Despite the 25,000 common carrier buses operated and the 18,000,000 automobiles in the United States, federal census figures show car riding is growing. Although the business of many industries in 1924 was off from 10 to 12 per cent, electric railways during that year carried practically the same number of passengers that they did during the previous year.

Can any one familiar with these facts consistently say that there is anything but a great future ahead for our industry? It isn't a frail plant to be toppled over by a strong wind, or withered by a summer sun. Rather it is a sturdy oak with roots buried deeply into the business, home and social life of the United States. Here and there you may find a branch that has been broken, but the heart of the oak remains firm.

The future of local transportation depends on the co-operation of the government and managements. Because in governmental action at present lies the immediate relief which we need and to which we are entitled, I wish to deal briefly with that. First, however, I wish to emphasize that government relief through legislation will come only in proportion to the extent to which we make our needs clear to the people's representatives in government. We cannot get relief, nor indeed are we entitled to it, if we depend on governmental agencies to discover our legislative needs and provide them on their own initiative. Our duty in this respect is clear. We must get into the van now and make our legislative fights honorably, continuously and fearlessly.

Today we are confronted with a situation in regard to the interstate regulation of buses which demands our immediate attention. The Supreme Court recently held that the state public service commissions have no control over the operation of interstate bus lines. Previously, the Interstate Commerce Commission had declined, on the ground that it was without authority, to assume control of bus lines in interstate traffic. As a result, today interstate buses, as unregulated common carriers, are competing on every hand with steam and electric railway common carriers, which long have been under governmental control.

This situation embraces danger not only to steam and electric roads but also to established bus lines of higher character, of which there are many in this country. Bus manufacturers and operators themselves are demanding regulatory legislation. Obviously, the present situation will not be permitted to continue. Probably this question will be taken up as quickly as any at the next session of Congress. Corrective legislation is certain to be passed, because its need cannot be discounted by even the most radical legislator. To permit such a condition to continue would strike at the foundation of all authority now vested in national and state regulatory bodies.

Despite the justice of appeals which

---

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

will be made for legislation, however, a great deal of educational work must be done. It is work which any transportation man can do with pride. Legislators will be eager to obtain unquestioned information regarding the facts. Hence it is the duty of every transportation man who believes in proper regulation, to his company and also to the public, to give generously of his time and effort in disseminating information on this question.

This is the immediate object before our industry, but a still greater obligation in relation to government activities rests upon us. That is obtaining general relief from our many onerous governmental burdens and interferences. In recent years there has been altogether too much legislation which imposes useless weights on transportation companies. As a result, our general transportation system in many cases has reached a state of exhaustion. It needs to have some of these loads lifted. Certainly no more should be added. It is plainly our duty to make every effort to demonstrate the unfairness of many of these burdens in the hope that legislation relieving us from them will be enacted.

All of us feel, of course, that we are carrying unjust tax burdens. And yet, I wonder if one of the reasons why we are borne down with them is that we have not made our situations clear. I have in mind particularly the paving taxes, which have been shackled on almost every city company in the United States since the inception of our industry. Latterly, about fifty companies have, through educating their legislators to the injustice of these taxes, freed themselves from them. Very few companies which have sought relief from this burden and made a clear demonstration of the fact that it was unjust have been denied relief. However, a very large number of companies which still are carrying the tax have either suffered in silence or made half-hearted or poorly organized efforts to bring about corrective legislation. Naturally, they are without relief.

Many similar levies were imposed on us in the old days when the assessment of public service corporation taxes was a favorite indoor sport, and there is no question but that we should be relieved of them. Our relief, however, will not come until we make intelligent and strenuous efforts toward getting it.

Whether it is the question of tax relief or some other form of legislation, we must approach our legislators openly, honorably and frequently, and see that our interests, which in the end are those of the great mass of people who use our services, are given fair treatment. They will not get it if we stay at home and wish for a change or send a few highly paid attorneys to represent us before legislative committees. Local legislative situations demand attention just as do those of the nation and states.

One of the gravest problems with which the industry has to cope is that of maintaining schedules in downtown streets. Where once this was a problem only in the larger cities, now, on account of lack of proper ordinances or inefficient enforcement, it has become an issue in almost every city and town in the United States. There is no doubt that both motor car owners and transportation companies have certain rights which should be granted by city officials, and, once granted, protected. No one will seriously contend that an electric car should not have the right-of-way over its tracks at all hours of the day and night. No other vehicle has any right in such circumstances to hold it up. Officials of every city should recognize this right and enforce it. Sooner or later this will be done throughout the United States, but, as in other cases where the co-operation of public servants is required, it will not be done unless we transportation men interest ourselves in seeing that it is done. It is our job to convince the car rider, the business man, the motorist and every one else that the interests of the community are best served by keeping traffic channels open. We can do it if we will put enough energy into the job.

The foregoing are only a few examples. In a measure the problems I have dealt with cannot be solved without the aid of persons who have no immediate monetary interest in our industry. Now, however, I want to turn to our own dooryard, or, indeed, the inside of our own house, and discuss particularly some duties that are incumbent upon us as a transportation family and on us alone.

Primarily, I want to urge the necessity of our rendering service in the broadest possible terms to the territories in which we operate. By that I mean rendering both passenger and freight service with the aid of electrically propelled cars, buses, trucks and whatever other means are necessary.

If we will fulfill all of the transportation requirements of our communities, none need have any qualms about our future success. If we render only a partial service and permit others to compel us to share the local transportation revenue with them, of course, we shall not fare well.

We have suffered much from competition throughout this country. Much of it has been unfair. You Middle Western operators, and particularly you men of Indiana, can appreciate the full significance of that statement. The wildcat bus and truck operators have preyed relentlessly on you for many years.

Here as elsewhere, however, in many instances, we have hesitated to broaden our service. There are many reasons for this. Many of them are sound from a business standpoint. Often, we have doubted if additional service was warranted. Again, some of us have hesitated to embrace new forms of transportation because we believed they would prove unnecessary or unprofitable. Competitors, sometimes encouraged by manufacturers, have not hesitated to enter the field.

Often they have been able to show a profit, and in almost every instance they have decreased our earnings. In this situation the question arises: What was and is the best thing to do? Shall we permit competition to enter in and take chances on its failing to make a profit, or shall we prevent competition by enlarging our own service and taking a gambling chance that the future will produce sufficient return to warrant our move? No broad, general rule for meeting such a situation can be laid down, but it is my conviction that in so far as possible we should so thoroughly cover our respective territories that competition at once will be discouraged.

In this connection, it may be interesting to review the code of principles regarding the respective places of the bus and the electric car in local transportation which recently were drafted by representatives of the automotive industry and the American Electric Railway Association and which were adopted by the executive committee last February.*

The representatives of the automotive industry on the committee which drafted these principles speak for the outstanding bus manufacturers of the country. They realize, I believe, that electric railway companies offer to them the greatest future dependable market for their product. Hence, they are subscribing to the constructive principles set forth. As time goes on, I believe that all bus manufacturers will recognize the soundness of these principles and govern themselves accordingly.

CONSOLIDATION OF MIDDLE WESTERN LINES

Conditions on interurban properties, particularly, have changed greatly in recent years. They are bad in many places now, especially on properties which have depended largely on short-haul business. Those that have been able to take care of long-haul business have not been hit so hard.

The suggestion has been made that we should attack this problem by greater consolidation of effort, if not by actual consolidation of physical properties. Intelligent consolidated effort in any form means two things: First, lowered expense and, second, more business.

The first consideration in any consolidation agreement, of course, is whether it is physically possible. It would seem to be here. Many of your properties now connect. In fact, I understand that by the laying of a comparatively small number of miles of track you could link up the greatest interurban systems in Indiana, Illinois, Ohio and Kentucky and tap Missouri.

If an arrangement could be made whereby these properties, large and small, could be operated as one, there is no doubt that great operating economies could be effected. It also is needless for me to point out that under such a consolidated effort you would be working under distinct advantages in obtaining long-haul freight and passenger business. I understand that you have done well through your freight association in attracting a certain amount of long-haul business, but more can be done if the proper facilities are provided.

From a standpoint of financing, I believe, consolidation would prove of great value. You are suffering now, I understand, from a lack of cars with which to move freight. Of course, you cannot get freight to move unless you have facilities for moving it. It is a waste of time to solicit such business when your facilities are inadequate to render the best possible service.

---

*See ELECTRIC RAILWAY JOURNAL, Feb. 21, 1925, page 288.

The business is to be had. That goes without question. The tracks are available. But the responsible, consolidated organization for getting the business and the equipment for carrying it are not available. The answer to such a situation would seem plain.

Finally, let me urge the great need for every one of us in this industry to become greater salesmen for it. We have the human links of a very great chain, but it seems to me that those links in many cases have not been welded together as well as they might have been. If we will devote sufficient energy to it, every man in the electric railway business can be made a real salesman, not only for our immediate product but for the entire industry.

One thing more. Let the association help you. It is your hired man. It has facilities and information for aiding you and wants to place them at your disposal. It cannot possibly anticipate all of your needs. But if you will make them known all of us will try to supply them.

A Major Operation on the Interurbans*

Consolidation of the Existing Lines in the Middle West, with Possible Construction of Connecting Links, Should Make it Possible to Give a Much Improved Through Service at Lower Cost than with the Present Independent Systems

By John A. Beeler
Consulting Engineer, New York City

INTERURBAN railways, quite generally, are today in a difficult position. They are suffering from a continuing decrease in passenger riding. Unfortunately, the interurbans of this great central territory are no exception to this general condition. The reasons for the declining patronage are: The comparatively recent extensive inauguration of highway coach service, the constantly increasing use of private automobiles by the people who formerly made use of the electric railway facilities, and the general business depression especially noticeable throughout most of this section of the country.

The greatest loss in riding seems to apply to travel which involves a distance of 50 miles or less. To put the matter bluntly, we apparently must face the fact that the bulk of the short-haul transportation is lost to many of the interurban railways. The question is what is the best course for the interurbans to take. They have contributed so magnificently to the upbuilding of this central territory that surely they will not be permitted to fail and to be abandoned without first making every possible effort to determine whether there is not still a place in the general scheme of transportation where these existing facilities can be put to good use.

At present the interurban systems in the central territory are laid out primarily for comparatively short-haul traffic, both freight and passenger. They radiate out from the principal cities to communicate with the smaller surrounding cities and towns. When through business is undertaken, as it has been to a certain extent, it frequently involves joint operation over the lines of from three to six different companies. Thus, any matter pertaining to the operation of such service comes under the supervision of from three to six managements; it requires the attention of the operating, traffic, accounting, claims, and mechanical departments of from three to six organizations. When a claim is to be settled it involves a determination of which one, or several, of the three to six companies is responsible. This often results in an expenditure of time way beyond the value of the claim.

When a traffic man goes out to induce a shipper to send his materials the electric way the shipper may be disposed to give his business to this man, but he realizes that his product will be in the hands of this man's road only for a small portion of the journey and he wonders what treatment he will receive at the hands of the two to five other managements involved. He wonders where he should check up in case of delay in shipment or from what road he would receive settlement in case of damage or loss. He fears the complications and passing of responsibility which come from a multiplicity of small road managements. There is also the continuous difficulty of getting cars back to the owner road, as the per diem rate does not compensate the owner road to the same extent as the use of the car.

COMING MEETINGS

OF

Electric Railway and Allied Associations

June 16-19—Society of Automotive Engineers, White Sulphur Springs, West Virginia.

June 22-26—American Institute of Electrical Engineers, Saratoga Springs, N. Y.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

August 12—Summer Outing at Pelham Bay Park, Metropolitan Section A.E.R.A.

August 13-14—Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Sept. 10—Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.

The foregoing leads up to two things:

First, that the opportunity, perhaps the only possibility, of continuing the interurban railways of the central territory on a successful basis lies in building up the long-haul service, both passenger and freight, between the principal centers.

Second, that this character of traffic can best be secured in a big way through either consolidation of these interconnected interurbans or at least by a pooling of facilities under a centralized management, which will in effect give the results of consolidation.

This may be an unpopular suggestion with some of the operating officials because it means the loss of jobs. But the time seems to be here when it is necessary to make a choice as between saving the job or saving the railway. To endeavor to save the job may result in the loss of both the railway and the job. As a parallel example, where would the great steam railroad systems such as the New York Central lines and the Pennsylvania lines be if they were operated as a series of small independent companies passing along their traffic from one to another.

Only in this central territory is the opportunity for consolidation and operation of all the interurban properties as one super system afforded. Here we already have the elements of what might readily be transformed into an electrified railroad system connecting such important terminals as Louisville, Indianapolis, Chicago, Cincinnati, Dayton, Toledo, Cleveland, Detroit, Jackson, Kalamazoo, Grand Rapids, Terre Haute, Columbus, Fort Wayne, etc.

By building a comparatively short connection between Crawfordsville, Ind., and Danville, Ill., this proposed system could be made to include the Illinois Traction System, extending westward to St. Louis. Similarly a line built from Elkhart, Ind., to Kalamazoo, Mich., would greatly increase the usefulness of the lines in Michigan for through business between Chicago and Michigan points and between Michigan points and towns in central Illinois and St. Louis.

To operate all these lines as a single system would accomplish two very important results, both having considerable influence toward making these properties pay. The first is that the economies which would be introduced are so obvious as hardly to require detailing. The management and overhead expense would be greatly reduced as there would be but one billing, one accounting department record, one claims record, one definite responsibility for damage or loss, one responsibility for planning facilities, one operating department, and so on. The second great advantage would be that the consolidated system would be able to offer its prospective customers the facilities of one great electrified railway system as against service over pieces of lines owned by the different companies, there now being 70 in this district.

---

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

Under such a unification plan it would be possible to utilize the equipment of the unified property to better advantage. A greater flexibility should result with less idle time and less non-revenue mileage. There would also be the possibility of sleeper trains and other through passenger service that are not now practicable in view of the difficulties involved in getting numerous managements to subscribe to the required standards of equipment and service.

By a general introduction of light-weight modernized equipment of attractive design, it is possible not only to popularize the service but materially to reduce operating costs. With the bulk of the present heavy equipment retired an excellent opportunity is presented to standardize on cars. This means a great reduction in material and stores, shop expenses, maintenance, and power, and fewer cars to render the service.

As a concrete example of what might be accomplished by consolidation and the use of light-weight equipment, let us consider the State of Indiana. Here there are twenty companies operating nearly 1,800 miles of interurban electric lines. This is 10 per cent of the total interurban mileage of the United States, yet this state has but 1.2 per cent of the area and 2.7 per cent of the population of the country. At the present time operations of these lines are approximately as follows:

Total revenue	$16,000,000
Operating deductions	13,000,000
Gross income	$3,000,000
Fixed charges	4,000,000
Deficit	$1,000,000

Were all the roads in Indiana operated as one unit, as outlined herein, with light-weight interurban cars, employing the one-man principle wherever practicable, I estimate that a net saving of $2,000,000 would result after paying interest on the new equipment required. This would give a surplus of $1,000,000 instead of a deficit of $1,000,000, which should be used to provide a more reasonable allowance to cover renewals and retirements and improve the service generally. The interurbans in Indiana are fairly characteristic of those in the district and represent about one-third of the mileage and traffic in the district.

Generally speaking, the interurbans, especially those operating on a private right-of-way, should render through, fast, limited stop service. Co-ordinated with them, to care for the local service and cover the territory not otherwise served, a comprehensive system of coach and bus transportation under responsible, and preferably centralized, control should be maintained. Already in the State of Indiana alone 206 independent companies are now operating 760 coaches over 3,400 miles of route. Thus, the importance of co-ordination is seen if duplication of service is to be minimized and the public transportation requirements economically rendered.

These suggestions are made not without appreciation of the fact that there would be many problems to be worked out to accomplish the desired end. If the traffic developed takes on considerable proportions, it might be necessary to get new rights-of-way in or around some of the cities. But with so large a system, and with the greater standardization and increased responsibility which it would have, there doubtless would be possibilities of working out better arrangements for terminal entrances and steam railroad interchange which are not now available to the individual electric lines.

"Transportation is civilization," says one prominent New York editor. Any form of transit that is not progressing is gone just as surely as old Dobbin and the hitching post. Perhaps this is an idle dream, but the trend of business and future outlook under the present operations demand prompt and heroic treatment. In my opinion, the present managements will do well to give serious consideration to any workable plan, either by actual consolidation or at least of unified operation of an extensive part of the electric lines which now are comprised in the Central Electric Railway Association territory. Right now is the outstanding opportunity to transform these properties into a prosperous electrified major railroad system of no mean proportions.

Style in Car Design*

The Appearance of a Vehicle Has a Decided Influence in Determining Its Ride-Getting Power—The Author Shows How the Automotive Vehicle Has Had a Distinct Appeal of This Sort, and That Similar Principles Can Be Used in Electric Railway Cars

By Charles Gordon
Western Editor Electric Railway Journal

Ever since the automobile first began to make serious inroads on the business of local and interurban transportation the words comfort and appearance have been used frequently in discussions of electric railway equipment. Interest in this subject has grown steadily as the effect of the increased use of automobiles has been felt. During the last four or five years the bus has been improved rapidly and has taken its place as an important local transportation agency for certain conditions. As the application of automotive ideas has brought about marked improvements in the appearance, comfort and merchandising appeal of buses, railway car operators and builders alike have manifested an increasing tendency to be critical of past precedents and methods, and to feel that electric railway cars can be further improved so as to attract additional riders from those who at the present time are stretching their incomes to use automobiles for many unwarranted purposes. Consequently most recent discussions of ride merchandising include consideration of the elusive subject of building cars that will create a desire to ride.

Real progress comes when one sees beyond the restrictions of precedent. Let us examine for a moment some of the influences which have affected present-day vehicle design, with the object of discovering their origin, and of directing our attention into channels that will lead to new lines of thought. Both street cars and automobiles date back to the carriage or coach. When electricity was applied to street cars, power was no longer a limiting factor and their size grew steadily. Finally the double-truck car was introduced, and steam road practices began to creep in. Structural steel shapes and heavy forgings were widely used. Trucks and brake rigging also showed the same influence. As a result weights mounted rapidly until finally realization of the vicious circle produced by heavy cars, which in turn required heavier rail and more rigid roadbeds, resulted in a widespread demand for weight reduction. When the pendulum of opinion finally swung to the lightweight extreme, parts were cut in strength, as well as in weight, to a point which resulted in some reaction. However, the increased use of higher grade materials again makes possible still further weight reduction. But throughout this development the appearance of the vehicle has been a secondary consideration.

Automobile Designed for Appearance

The automobile since the start has remained a vehicle for individual or private transportation. For this reason, the element of appearance or style has been a very live factor ever since the early milestones of mechanical development were passed. Being primarily a pleasure vehicle, the element of sport has exerted a strong influence on body appearance. During the formative days, body designers — not engineers, but rather those interested in the sales value of the design—sought for effects which would typify rakishness and speed. The long streamlines of fast water craft furnished the desired *motif*, and soon the marine element made a distinct mark on automobile architecture. The engine was put out in front of the dash, the body was dropped lower, side doors were installed, hood lines were raised, sharp angles eliminated, and soon the streamlines of the modern automobile were evolved. Due to its direct automotive relationship, and the influence of automotive personnel, the bus is making rapid progress in the same direction.

The general effect produced by this attention to body lines and details of automotive vehicles has proved of direct merchandising value; in the one case on the sale of the vehicles and in the case of buses on the sale of rides in them. If there is any question of this value in your mind try to explain why you turn in a perfectly good and serviceable 1922 or 1923 model automobile to get a 1925 model, or why passengers will flock to the longest, leanest and sportiest looking bus you can put on the road. For want of a better term, I have called this elusive merchandising appeal the appeal of "style."

---

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

"What is it," transportation men ask, "that makes people ride in buses?" Increased comfort doesn't explain it. Surely they are not safer than electric cars! Why will a passenger ride 50 miles in a low-hung bus that winds its way over a heavily traveled road or over congested and slippery pavements when a parallel interurban gets him to his destination just as fast or faster over a private right-of-way and at a lower fare?

"The rubber urge"; "comfortable seats"; "novelty"; "reduced noise"; "flexibility at terminals"—yes, part or all of these have some influence, but there is another very important factor. That is the appeal of "style." Once this factor in the sale of transportation is definitely recognized, an explanation for some of the inconsistent preferences exhibited by the purchasers of transportation is found, and as all good merchants should do, we may proceed intelligently about the business of satisfying the demand. That is one safe rule for building patronage in any business.

In one location which happens to occur to me as an illustration of a point I am making, a high-grade interurban line was paralleled by a bus competitor. The railway also put on buses, and soon an active fight for business developed. In the course of this struggle, three different types of buses were put on in rapid succession, each more rakish looking than its predecessor. During this time the interurban continued rendering service, which made the run in a shorter time and at a lower fare. As each new bus appeared, however, the passengers flocked to the most stylish and rakish looking model. Call that appeal what you will, I am referring to it as the appeal of style.

From this standpoint, then, the problem of car design consists of producing a visual invitation and creating an instinctive desire to ride. In general this might be expressed in a slightly different way by saying that the problem of building business on electric cars consists, to a large degree at least, of making it stylish to ride them.

Street cars must continue to haul the masses during the rush hours, and they must be designed and built with that end in view. But even the workman and mechanic are by no means beyond the influence of style. Large numbers of them have taken to the automobile for getting to and from their work. Not only does the railway lose the owner of the machine, but it also usually loses three or four additional passengers, who ride home with their more fortunate companion. And my point is that style is a potent factor in this use of the automobile by workmen.

I believe that serious consideration of this appeal to style, and the natural human satisfaction that comes from stepping into or out of a smart equipage, may be so capitalized in car design as to constitute a material aid in winning back former patronage and building new business. Street cars have, in a sense, been "over-engineered." By this I do not mean that there has been too much effort and time spent on the scientific employment of materials, or in the development of construction methods, but rather that utility and durability have been too much considered to the exclusion of appearance and merchandising appeal. The automobile industry has developed a brand of body designers who are primarily artists. They draw beautiful pictures of bodies that they think will appeal to the public, and it is then up to the engineers to find out how to build them. This usually is far from an easy task. Compromises must be made due to considerations of cost, durability and maintenance. These latter factors are of vital importance in the case of cars, but at the same time appearance must be made one of the primary considerations and not secondary, as has too frequently been the case in the past.

There seems to be no inherent reason why an electric car, operating on rails, cannot be given a rakish, stylish appearance. The structural problems involved seem fundamentally simpler than those encountered in an automotive vehicle, carrying its own power plant and designed to operate on the highway. But the desired results will be accomplished only by a courageous departure from existing precedent.

GRAND RAPIDS COMPETITION ATTRACTS ATTENTION

We have made considerable progress in this direction within recent years. During the past few months the Grand Rapids Railway, through the action of its vice-president and general manager, Mr. DeLamarter, has attracted the attention and interest of the entire industry by endeavoring to stimulate car design development through a form of competition between three car builders, who were given only general instructions as to the type of car desired, and were allowed more or less a free hand in developing sample cars which they considered best adapted to meet the requirement of building street car business. These cars, which have just been delivered, have been described in detail in recently published articles (see ELECTRIC RAILWAY JOURNAL, May 9, page 721; May 16, page 767, and May 23, page 807). They are now undergoing a series of tests, which will include an attempt to determine the preferences of the riding public of Grand Rapids. They include a number of interesting departures from previous practice, particularly along the lines of merchandising appeal, improved riding qualities and noise reduction.

There is a marked effort in all three cars to accentuate streamline effects. On one car a change from customary painting practice helps to carry out the effect sought. Instead of finishing the doors in varnish, or in one color of paint, the body colors both above and below the belt rail are carried across the doors and are split at the belt rail line so as to accentuate the effects produced by solid bands of color extending the entire length of the car. Still another interesting innovation consists of a skirt, similar to that sometimes used on buses, to conceal part of the trucks and apparatus under the car.

There is one phase of this experiment which deserves more than passing attention, and which has considerable significance in connection with the electric railway car-building business. This business is distinctive in that it is not a manufacturing business in which the product is developed, manufactured and sold. It is more in the nature of a contracting business in which the builder bids on specifications and in some cases more or less complete plans furnished by or developed for the customer in accordance with his ideas. This is particularly true of the larger properties in position to buy cars in comparatively large groups. The high cost of special development for a small order usually forces the small road to accept one of several designs developed for large systems, which the car builder offers with such minor modifications as will fit the requirements of the individual property interested.

This practice usually results in each large order being a complete development job to fit individual requirements. There is much less continuity of development than would be the case could several types of equipment be designed to fit certain general conditions and then manufactured in quantities and sold outright. In the manufacture of buses there is a distinct tendency in this latter direction, and the resulting progress that has been made in design indicates that under these conditions competition is allowed to have its fullest effect in stimulating development.

The Grand Rapids experiment is to some extent a step in this direction. It is apparent that each of the car builders involved, if convinced that a market existed for such cars on a considerable number of properties, would take advantage of the opportunity to develop its product gradually so as to include the best of available ideas.

The committee on unification of car design, at its last meeting in Chicago, considered this subject, and discussed ways and means in which this movement might be encouraged. At that meeting it was decided to investigate the possibility of collecting clearance data from the various roads of the country, with the object of determining the limiting dimensions that fixed the sizes of cars on various properties. It was the opinion of the committee that the savings which would result in the cost of equipment would justify considerable study of the possibilities in this direction.

The Car Builder's Car*

By GEORGE L. KIPPENBERGER
Assistant General Manager
St. Louis Car Company

IN HIS paper on "Style in Car Design," Mr. Gordon has pointed to facts which may be deemed fanciful by some of us, but which are nevertheless timely and fitting for thoughtful consideration.

Mr. DeLamarter, in planning his experiment, in no sense lost sight of the fact that the sturdy, conventional, present-day electric car on rails is the only effective medium for taking care of peak-hour, mass transportation. Other types of vehicles, including buses, cannot. This need not preclude the possible need of a de luxe type of "electric rail coach."

---

*Abstract of written discussion before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

Regardless of opinion, the paper under discussion indicates that this question is a live topic for consideration at this particular time. The present-day riding public—product of this advanced age—is, we may say, fastidious. A natural incentive, therefore, inclines the owners of rapid transit, a most vital need of the age, highly to improve and embellish their various vehicles of transportation, in a strained effort to keep pace with the discriminating sense and tastes of the times. It would seem logical, therefore, for some far-seeing individual to conceive of and initiate into use a new type of vehicle, electrically propelled on rails, extreme in design, and differing radically, in form and structure, from that now in common use, and at the same time conforming in "style" and fashioned in pattern to the cravings of this "de luxe" age.

This incentive, if followed, would lead to the perfection of an "electric rail coach" of such body lines, appointments and ease of carriage that prospective patrons will instinctively become attracted to its use as a matter of choice and preference.

The three sample cars recently designed for the Grand Rapids Railway, by as many different car builders, are not extremely radical in the full sense of the word. In the sense that they are fully equipped with the very latest improved devices, are as easy riding and silent running as the art will permit, have faint suggestions of a few automotive ideas, and are pleasingly and highly decorated, they typify an approach leading to the ideal in the mind of the manager of that railway.

The topic under discussion leads to the thought: Will a radically changed type of car, of a "style" conforming to the dominating tastes of the present-day riding public, pay its way? Will first cost, maintenance, and limited carrying capacity overbalance earning power?

The advocates of a radically changed car contend that the appeal of the embellished vehicle will attract fares new and old, now lost to competing vehicles. In other words, it is contended that the people will patronize a vehicle which caters to their taste, and are willing to pay to be satisfied.

The automotive industry expends millions annually in engineering research and plans for betterments to satisfy public demands. One concern alone expended $5,000,000 on the single item of developing a more perfect radiating system. The allied electric railway industries expend annually a good sum of money upon development and in the way of improving devices and accessories. Research engineering work of this nature, however, is generally scattered and done in a diversified way, without any concentrated effort to perfect a particular item or solve a difficult problem. The expenditures in money, time and effort made by our industry to accomplish these ends admittedly are in no way comparable and commensurate with like expenditures made for the same purpose by the automotive industry.

If there is a place for the radically changed street car or "electric rail coach" today, why has not the car building industry initiated its use by offering it to the trade? Permit me to illustrate my impression in answer to that query by relating an incident:

Upon delivery of the three different sample cars to the Grand Rapids Railway, the general manager invited quite a number of railway men from far and near to witness the first test trial runs. One of the group making the inspection said: "This is the first time the *car builders* have built a car for the car rider." His statement was immediately corrected to, "This is the first time the car builder *has had an opportunity* to build a car for the car rider." Mr. DeLamarter's innovation gave the car builders an opportunity more or less free to build a car to attract and please the public.

Mr. Gordon, in his paper, has pointed to one of the reasons why the design of the street car has not developed and advanced, and seemingly has not kept equal pace with competing vehicles, along the lines we are discussing. The car building plant is a contract shop. We contract to build on specifications—the master mechanic's specifications—and the result is a master mechanic's car, well built, if you please, from a maintenance standpoint and efficient for handling passengers. From this discussion, however, we sense that in this day and age passengers want something more than being safely handled.

Were it possible for the car builder to merchandise his car—his *standard* car—if we dare mention the word standard in connection with cars before railway men—the builder would have opportunity and incentive constantly to improve and develop style and design. Likewise he would then have the required incentive which that opportunity afforded of improving facilities needed to reduce costs of the various fabricating operations involved in his design. The design being his standard for common merchandising, he could fabricate most of the parts for stock, in quantity production, at reduced costs. Building his standard car under his own specifications, he would be free to put quality into his work and place the stamp of individuality on his product, even though he built several models.

On the other hand, the railway manager, usually not the railway owner, although recognizing the public trend, has a sense of responsibility to stockholding interests and may not be sufficiently brave or free to experiment and depart from the common practice of equipping his line with cars built to withstand rough usage and designed primarily for durability.

In common practice the car builder is expected to build a car that will endure four or five times longer than a bus or automotive vehicle which meets the demand for stylish appearance. As the public is the final arbiter, we may expect the public reaction to the Grand Rapids experiment to have a far-reaching effect. Favorable reception of the sample cars submitted may be expected to stimulate effort in the designing of cars along the same general lines that will combine durable qualities with artistic effects.

Executive Committee C.E.R.A.

W. S. RODGER, general traffic manager Detroit United Railways, presented a report of a special committee of the Central Electric Railway Traffic Association, recommending by a majority vote of the committee the apportionment of loss and damage claims on a mileage basis between interested roads, instead of on a revenue basis. After some discussion, the executive committee voted to adopt this recommendation, even though some members favored the revenue basis of distribution.

On the invitation of President Coates, Lucius S. Storrs, managing director American Electric Railway Association, addressed the committee briefly, and offered the Central Association the co-operation of headquarters and of the American Association.

It was decided to hold the annual meeting on Jan. 28 and 29 at French Lick. This date is fixed by the constitution, and as the French Lick Springs Hotel had offered the same schedule of special rates as were extended for the summer meeting, it was decided that this would be the best location.

Executive Committee C.E.R.A.

Weight Equipment*

By Howard Gass

St. Louis Car Company

TO THE minds of mechanical men improvement means that combination which will result in low maintenance costs and reduction of equipment failures. To the transportation man, improvement means low operating cost, faster passenger interchange, faster acceleration and deceleration and consequently higher schedule speeds. To the purchasing agent it means lower first cost and reduced investment.

In times past most equipment was built in accordance with the ideas of the master mechanics and operating officials. Prime consideration was given to operating and maintenance costs, with some slight idea of appearance, but without any specific consideration of the rider's views and taste in the matter. Cars were built according to the operating requirements, but without much regard for the views of passengers. Long-established precedent was an important factor in fixing the type of equipment specified.

Changes designed to improve riding and comfort were judged primarily from the standpoint of maintenance cost and were usually rejected in favor of older and more familiar forms of construction.

The introduction and development of the bus to meet the desires and fancy of the public have led to a rapidly changing point of view. Our indifference to the public's preferences in the matter of equipment has been brought about by our proximity to the problems of operation and maintenance and the inability to view the business of transportation with sufficient perspective. To accomplish this it will be necessary for each department to compromise in favor of pleasing the car rider. Lowest possible maintenance cost dictates substantial construction, heavy cars, large power and brake units—all tending against high schedule speeds. Operating economy requires light weight and high schedule speed. The public demands both comfort and speed. Present-day improvements may be expected to be along the lines of slight additional increases in weight, higher schedule speeds, and concentrated attention to passenger comfort.

---

*Abstract of paper read before annual meeting Mid-West Electric Railway Association, Kansas City, Mo., May 25-26, 1925.

Today we have single-truck cars seating 30 people, making a schedule speed of 10 to 12 m.p.h., and weighing 16,000 lb. Double-truck cars are being built to seat 44 passengers, which make schedule speeds of 10 to 12 m.p.h. and weigh 25,000 to 30,000 lb. Lightweight suburban cars seat from 45 to 50 passengers, make 20 to 22 m.p.h. schedule speed and weigh 30,000 to 36,000 lb. Cars of the same capacity and designed for speeds of 30 to 35 m.p.h. weigh from 36,000 to 40,000 lb. This equipment shows a marked reduction in weight in comparison with cars for similar service built ten years ago.

Many features now being added to cars to increase safety, comfort convenience and speed of handling passengers tend to increase the weight of cars. Pneumatic operation of many auxiliaries causes a considerable increase in the weight of air equipment over that required for brakes alone.

Weight reductions have been cumulative. Reduced body weight has allowed the use of smaller motors and this in turn has permitted material reductions in truck weights. Use of higher grade materials has also aided in this process. Further progress in this direction is the probable method which will be used for any further weight reduction.

During recent developments increased attention has been directed to the use of aluminum and its alloys. This material not only reduces weight, but it also has a pleasing appearance as a finish. It does not ring like steel and consequently its use will tend to reduce noise. In the design of car and truck structures, however, deflection is of importance as well as strength, and this factor must be considered. Combination materials like plywood with steel faces are also being produced for car construction, but problems are presented to the builder in the application of such materials.

Wood still offers the car builder many advantages over other materials for body construction. A $\frac{1}{16}$-in. steel plate applied to the side of a car with rivets will show dents at the rivets and buckles between the stiffening members. A $\frac{3}{8}$-in. wood sheathing will weigh no more than the $\frac{1}{16}$-in. steel sheet, will have no buckles and will give the same strength. Similar comparisons may be carried through other members of the car framing.

In the sample car recently built by the St. Louis Car Company for Grand Rapids the underframe is of steel, the sides are composed of steel sheets, and the floor, posts, roof, sash and doors are all of wood. Except at the bolster, a very light wood post is sufficient to stiffen the side girder, and the bolsters can be stiffened by light drawn-steel sections. Instead of being supported by steel carlines, which must necessarily carry wood furring for the attachment of the wood, the roof is supported on wood carlines only with an upper and lower member tied at suitable points with spacing blocks. This construction is in some respects similar to that in an airplane wing. Furring strips are of selected hard wood.

The wood posts have sufficient section to permit running bolts through them without destroying their usefulness as girder stiffeners. They are cut down at the window sill so as to give the maximum glass space for vision. The upper portion is increased in size to provide a secure fastening for the letter panel and the roof carlines. The light wood top plate forms a spacer for the posts, a stiffener for the letterboard and a firm connection for the roof. The latter is of the arch type and will carry its own weight, the only requirement being that the posts shall have sufficient stiffness to resist the tendency of the arch to flatten.

The ends of the car, which are subject to collision shocks, have a steel facing over an oak crown. In this we are following the practice of the ship builder, who backs his heavy armor with an oak frame to absorb and distribute shell impact on the hard steel face. For the interior, woods of beautiful grain are selected.

For the trucks, to reduce vibration, steel rims and steel hubs with wood filling plates are used. The hub and rim have suitable copper connections for the transmission of the ground circuit to the rail. Brake noises are reduced by the use of fabric-lined clasp brakes, using material with high coefficient of friction and heat resistance. Motors were specially selected to deliver their maximum power at the same speed, so that there should be no whirr or humming noises set up while in operation.

Seats are covered with imitation leather and have deep spring cushions and backs, so that the rider has all the comfort he could expect in a moderate priced automobile. In spite of the many innovations and high-grade materials used on this car, the purchaser is receiving a unit at a cost very slightly if any in excess of that which he has been accustomed to pay, but which will effect marked economies in the cost of operation.

Oils and Pigments Used in Car Painting*

BY H. G. NOBLE

Superintendent Everett Shops,
Boston Elevated Railway, Boston, Mass.

PIGMENTS most used for car painting are lead, carbon, zinc and lithopone. The old-fashioned idea that lead alone is the only satisfactory pigment for paint has been disapproved. In many instances other pigments do quite as well and in some cases produce a paint which does better than straight lead. For outside work, lead in combination with other pigments is still the most generally used. Lead alone chalks too much and does not give the maximum whiteness due to the chalky surface picking up dust, etc. Zinc oxide, which is today almost universally used in combination with lead and other pigments, is the finest of all and very white in color. Owing to its extreme fineness, it requires more oil than any other white pigment to become fit for the brush. In 100 lb. of the zinc oxide paint ready for use, there are 46 lb. of oil to 54 lb. of zinc, while in the same proportion in corroded white lead of the same consistency there are 76 lb. of pigment to 24 lb. of oil. Owing to the fact that zinc oxide is not affected by any gases present in the atmosphere and that it does not affect other pigments with which it has been mixed, it is very extensively used in high-grade white paint and enamel for both inside and outside use.

Carbon pigments are quite extensively used in the manufacture of metal protective paints. The carbon blacks are practically pure carbon. They comprise lamp black, a specially prepared soot from oil lamps, gas black from natural gas, and graphite, which is a natural product now also produced artificially by means of an electric furnace. These pigments are chemically inert. The particles are extremely fine, and their specific gravity low. Consequently, they require a large amount of oil to make them fit for the brush. Their covering and wearing capacity is a striking example of the durability of inert pigments when used in painting. As proof of their durability, lampblack lettering on old signs has been frequently known to stand out in relief after the wood surrounding it has been deeply worn away by the elements. One reason lamp blacks are so permanent is that they have no drying properties like lead, and therefore prevent the burning up of the oil film due to progressive oxidation.

Lithopone is essentially a combination of co-precipitated zinc sulphate and barium sulphate, which reacts chemically to form a compound, roughly making 30 per cent zinc sulphate and 70 per cent barium sulphate. This pigment is very fine and white, and if properly made has excellent body and other very valuable properties as a pigment. It darkens in the sunlight and recovers its color in the dark. Most of the lithopone now made is practically lightproof. Lithopone is used to make interior paints, first coat or primer whites, flat whites, and all finishes, and the lighter shades of floor plaint. It is very extensively used in combination with zinc to make the so-called mill white enamel.

---

*Abstract of a paper presented before the New England Street Railway Club, Boston, Mass., May 28, 1925.

Earth colors are compounds found as deposits in the earth and are utilized as pigments, either in their natural state or after grinding. The principal varieties are the mineral brown, ochres, umbers, siennas, natural iron oxides, and mineral black. Of the earth pigments most commonly brought before the layman are the iron oxides which range in color from warm brown to a brilliant scarlet, depending upon the composition of the original mineral and the degree of oxidation. The thousands of freight cars in operation on the various railroads, which are all painted with iron oxide paint, give a good idea of the enormous quantity of this pigment which is used. Venetian red, one of the most popular and durable of red oxides, is made in large quantities by roasting copperas, the byproduct from pickling iron. Most of the Venetian reds contain calcium sulphate, as the copperas is generally mixed with lime before roasting.

Chemical colors are pigments produced by chemical action of one substance (usually in solution) upon another resulting in the precipitation of a colored compound. Linseed oil is usually preferred for the manufacture of outside paint and enamel. It is the most abundantly obtainable of all oil and its cost is usually moderate. Results obtained with it are more uniform than with any other oil, and it produces a very tough film, which allows for the expansion and contraction of the surface to which it has been applied. Linseed and perilla are drying oils. Chinawood or tung oil is used more for the manufacture of waterproof varnishes, floor paints and enamels than in paint. It is also used to a considerable extent in the making of flat wall finishes. The oil requires special heat treatment.

Turpentine or thinners are added to paint for the mechanical effect, to facilitate the labor of spreading, to reduce excessive amounts of oil, to hasten setting of paint, to assist the penetration of the priming coat, to reduce the gloss of the undercoat and thus improve the adhesion of subsequent coats and to destroy the gloss in a finishing coat where an eggshell finishing coat is desired. For this class of work, turpentine, wood turpentine, substitute turpentine, benzine and mineral spirits are most generally used. The greatly decreasing supply of pure spirits of turpentine has forced customers into the adoption of substitutes made from mineral oils, and experience seems to show that in the majority of cases a good substitute turpentine answers quite as well as pure spirits. The fact that both turpentine and turpentine substitutes are volatiles and on exposure to the air evaporate rapidly and pass out of the paint, having no real effect on the paint film, leads to the conclusion that, in the majority of cases, one answers as well as the other.

In the past, when labor was cheap and time meant nothing, it was customary to apply a flat color and then apply a coat of rubbing varnish when painting the cars. After rubbing, a coat of finishing varnish was applied to obtain a high gloss finished job. With labor costs high and time a big item, it has become necessary to produce a finish which will cut down labor costs and save time. The result is the perfection of an enamel paint, which is a combination of color and varnish properly blended and which combine two operations in one. Enamels, like paints, are composed of liquids and pigments. The pigments used in making enamels are a great deal the same as those used in making paints, except that zinc is used almost entirely in place of the lead in producing the white. Practically all of the high-grade white enamels contain nothing but zinc oxide, while the colored enamels may be a combination of zinc and a predetermined coloring pigment or it may be a straight color pigment.

The vehicle in an enamel is a varnish which is a combination of varnish gum and oil. Several grades of this varnish are used in making enamels. These range from a short oil rosin varnish up to a long oil Kauri gum varnish. The short oil enamels are very quick drying and do not render long service. The long oil enamels are slower drying, easier working and very long lived.

The oils used in making the lighter colored enamels must be bleached before being made into varnish vehicle, as it is really the oil or vehicle in any paint or enamel which gives it its life or wearing properties. A long oil enamel for all exposed surfaces is really the only satisfactory material to use, as it costs just as much and more to apply cheap paint or enamel than to apply a first quality product.

UNDERCOATS DESERVE ATTENTION

Paint or enamel may be applied by brush, spray or dipping. There are great differences of opinion as to the best methods of application; each, however, has its place. Too much emphasis cannot be made as to the proper preparation of the job on hand and the proper application of the undercoats, for unless the surface and undercoats are right, the finish coat, no matter how good, will fail. We never apply paint to unseasoned wood or damp or wet surfaces and shellac all sappy spots in new wood. All surfaces should be thoroughly cleaned before repainting, and metal surfaces must be thoroughly brushed off to remove rust before painting. Sufficient time must be allowed before the application of the various coats. When using a product of some paint manufacturer, the instructions given on the container should be followed carefully. The manufacturer has probably been in the business for years and is just as anxious as you are to have the material give a satisfactory job.

I have often been asked whether I do not think better results can be obtained by making up our own formulas and putting them out for bids. To this I can answer, positively, no. For in putting out specifications for bids, the unscrupulous are allowed to quote against the honest manufacturer, and the man buying the goods can only place his orders with the lowest bidder. To add to this, the minute you accept a paint made under specification different from any manufacturer, his responsibility ceases. He will simply tell you if the paint fails that it was made in accordance with your specifications, and if it has failed it is up to you. Even a chemical analysis of a specification paint will not be of assistance; it will only indicate to the chemist whether the paint is properly compounded, but the method of preparation, which is quite as important as the composition, will not be known.

Central Master Mechanics Meet at French Lick, Ind.

PROGRESS reports of various committees were made at a short business meeting of the Central Electric Railway Master Mechanics Association, held at French Lick, Ind., during the annual summer meeting of the Central Electric Railway Association. These included reports from the committees on standards, uniform charges for the repair in interchanged cars, United States safety appliances, program, and membership.

As a result of a careful search of past records, the committee on standards had compiled a record of all previous equipment standards of the Central Association. These were outlined in the report, from which it developed that most of these standards are quite old and in many cases obsolete. The committee was commended for its careful work, and it was the opinion of the meeting that all standards which have become obsolete should be weeded out and discarded. P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, Akron, Ohio, suggested that a standard of marking for freight equipment in the association territory would be very desirable, and that a study of this matter might properly be made by the standards committee. The subject was referred to the committee.

Discussion took place regarding the need for running boards on top of electric railway freight cars, and of ladders on the sides of the cars. It was pointed out that although the electric lines in the Central territory have had no particular difficulty during many years of operation, there is a potential danger until a full understanding is obtained with the Interstate Commerce Commission relative to electric railway conditions, and necessary modifications made of the rulings of the commission to take care of electric railway conditions. It was decided that when the committee has completed its report the association should consider the best course to follow in clearing up this situation.

The progress report of the committee on uniform repair charges stated that this committee is compiling cost data to be used as the basis for making up a schedule of charges. Considerable study has been given the matter of labor costs, with the object of selecting a rate which would be equitable under the variable wage scales on the various roads. A tentative rate of 70 cents per hour is being considered.

The next regular meeting of the association will be held at the Grand Hotel in Anderson, Ind., on Sept. 10, 1925. This is just one day before the meeting of the Central Electric Railway Traffic Association, which is to be held at Webster Lake, Ind., on Sept. 11 and 12.

American Association News

Executive Committee

MONTREAL was the place of meeting of the executive committee of the American Electric Railway Association held on June 10, the members being guests of Col. J. E. Hutcheson of the Montreal Tramways. Members present were: President J. N. Shannahan, Managing Director L. S. Storrs, Executive Secretary J. W. Welsh, R. P. Stevens, E. P. Waller, L. H. Palmer, W. H. Sawyer, C. E. Morgan, C. E. Stephens representing F. D. Shute, F. R. Coates, H. D. Briggs, T. C. Cherry, C. S. Hawley, A. A. Hale and L. E. Gould. Guests present were Labert St. Clair, J. W. Colton, H. L. Brown and Morris Buck.

After approval of the minutes of the last meeting, Mr. Welsh read the revised budget for the year. He stated that the association is doing somewhat better than was anticipated in view of the expenditures made necessary by its increased activities, and that there probably will be a small surplus at the end of the year. Dues, he said, are coming in in good shape. Reports of the various committees are being prepared and will probably be ready for printing by July 1.

Mr. Stevens read the report of the auditors for the association. All accounts were found in good condition. The report of this committee was approved and placed on file.

Mr. Storrs reported on the status of motor vehicle common carrier legislation.

For the subjects and meetings committee, Mr. Sawyer explained the status of the program for the October convention. Mr. Coates proposed the use of the Hippodrome in place of the Greek Temple for holding meetings. After some discussion, it was decided that, since space for exhibits had been sold with the understanding that all meetings would be held at the end of the pier, no change be made in the meeting places for this year. President Shannahan suggested that in the past the attempt had been made to place too many subjects on the program. Accordingly, he thought that the program should be restricted this year as far as consistent with the idea of getting better quality of papers and discussions.

For the publicity committee, Mr. Welsh stated that it has assisted in the preparation of a number of articles by special writers dealing with electric railways. A booklet telling of the various kinds of work available in the industry for young men has been prepared for sending to the colleges for distribution.

Mr. Palmer read the report of the committee on publications, giving the present status of *Aera*. This report was adopted.

Mr. Storrs reported regarding the matter of handling funds for the Advisory Council. The council has passed a resolution recommending that such funds be kept in a separate account, from which payments should be made with the approval of the executive committee and the managing director. This was approved by the executive committee. Mr. Shannahan told of the method which has been adopted for solicitation of funds for the Advisory Council. It has been planned to request each member company to make a voluntary contribution. After some discussion, Mr. Sawyer and Mr. Coates were appointed a committee to solicit subscriptions.

Mr. Palmer, for the committee on company and associate membership, stated that seven new members have applied for admission. These were the Warren Street Railway, the General Engineering & Management Company, the Adams & Westlake Company, the Lovejoy Manufacturing Company, John Lucas & Company, the Norma-Hoffmann Bearings Company, and the Pennsylvania Rubber Company. All of these applicants were elected.

For the committee on individual membership, Mr. Morgan stated that the membership has had a net increase of five. The Metropolitan Section, he said, now has over 1,000 members.

Mr. Morgan, on behalf of the exhibit committee, stated that the space sold this year to date is 33,304 sq.ft., as compared with 29,936 sq.ft. at the corresponding time last year. Space under the control of the exhibit committee has been reserved for the display of double-deck buses near the Shelburne Hotel. The relative space being used for automotive equipment this year will be approximately the same as it was last year.

The following nominating committee was announced by President Shannahan: T. N. McCarter, chairman; C. D. Emmons, J. H. McGraw, T. W. Casey, Thomas Fitzgerald, Richard Merriwether and G. J. Kuhrts. The appointment of this committee was approved.

Mr. Stevens reported on the status of referendum 45 of the United States Chamber of Commerce and Mr. Welsh read Mr. Gadsden's report on referendum 46. His report was accepted.

The committee on revision of the constitution presented a report containing several proposed changes in the scope of the association to include other forms of transportation, such as the motor bus, the trolley bus and the gas rail car, when operated by or in conjunction with electric railway companies. Changes to provide for the Advisory Council and the managing director also are included. These were read by Mr. Sawyer of the committee, in the absence of Chairman Emmons. After adoption by sections, the entire constitution was approved for submission to the membership. A vote of thanks was given to the committee for the excellent work it has done.

On motion of Mr. Sawyer, a resolution extending the thanks of the executive committee to Colonel Hutcheson for his hospitality in entertaining the committee was passed unanimously.

It was decided that the next regular meeting of the executive committee would be held at Atlantic City next October, in connection with the convention.

Way Matters

REPORTS of various sub-committees were received and adopted at a two-day meeting of the committee on way matters held in New York City June 8 and 9. In the matter of the review of existing standards there was some discussion regarding the iron binding under special trackwork pieces. The committee agreed to recommend the continuation of the study of this subject to the ensuing committee and voted to request the ensuing committee to consider redrawing such plans of other associations as are required for the manual.

A brief report on the subject of standardization of frogs and switches was presented. Little progress has been made since the last meeting. A comprehensive report on surface hardening of rails was adopted. Some changes were made in the report on design and specifications for railroad crossings. It was then adopted.

Reduction of noise in car operation was discussed at considerable length by the committee and some amendments made to the report, after which it was adopted. The committee voted to recommend the continuation of the study of the subject by a special joint committee of way and equipment engineers. A report on the design of substitute ties was amended and adopted.

Information presented on the subject of arc welding repairs to tracks and welding rod specifications caused a lengthy discussion. The committee voted to recommend the publication of the American Welding Society specifications in the report and to continue the study of the subject.

Tolerances and the milling of rail ends were discussed in connection with the work of the special committee to confer with the American Society for Testing Materials. The way committee voted to oppose increasing of the carbon in the girder rail specifications and decided if higher carbon was desired by the steam roads they should prepare a class "C" specification and submit same to A. E. R. E. A. and the A. S. T. M. in the regular way. No report was submitted on the design of limit of wear gage, wheel mounting, etc., because the sub-committee is waiting for information from the equipment committee.

Welded rail joint tests now being made were considered. The committee on way matters decided to take no action on the question of modification of the repeated impact tests, as it was felt the committee on welded rail joints was handling the matter satisfactorily.

Members present were: E. M. T. Ryder, J. H. Haylow, E. B. Entwisle, C. A. Alden, C. L. Hawkins, V. Angerer, O. C. Rehfuss, J. B. Tinnon, D. J. Graham, M. M. Johnston, T. J. Lavan, E. L. Lockman, H. E. Bean, W. W. Wysor, C. F. Gailor, A. T. Spencer, R. H. Dalgleish, sponsor, and H. H. George, chairman.

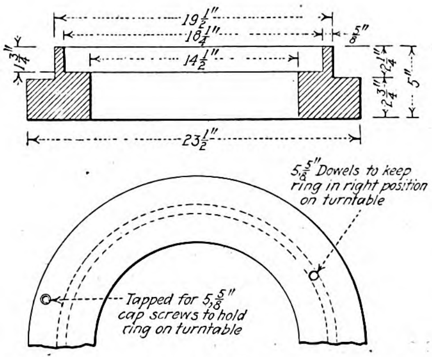
Maintenance of Equipment

Boring Armature Bearing Housings

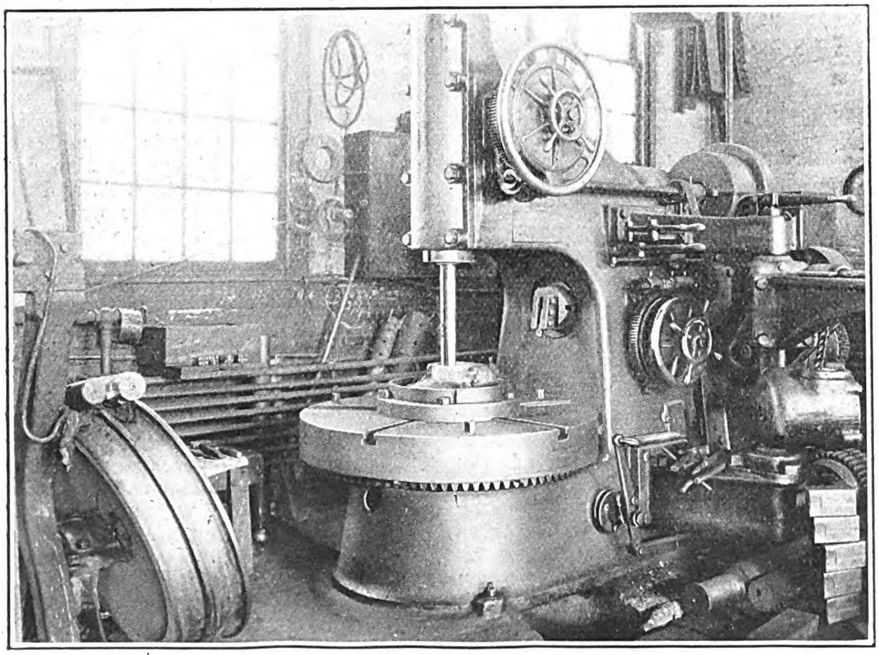
SPECIAL precautions are taken in boring out the bearing fits in the housings of Westinghouse type 306 CV railway motors at the Utica Park shops of the New York State Railways. The work is done on a large Niles-Bement-Pond boring mill.

The feature is the fixture used to hold the housings in alignment. The same fixture is used for both the pinion-end and commutator-end housings. It consists of a cast-steel ring with different diameters provided to fit the two housings. The pinion-end housing is bolted to the ring having a diameter of 18¼ in., and the inner ring, 14½ in. diameter, is used for bolting the commutator-end housings in position. The same holes are used for bolting the housings to the ring as are used for holding them in the motor frame. The ring is held in position on the turning table of the boring mill by five ⅝-in. dowel pins and five ⅝-in. cap screws.

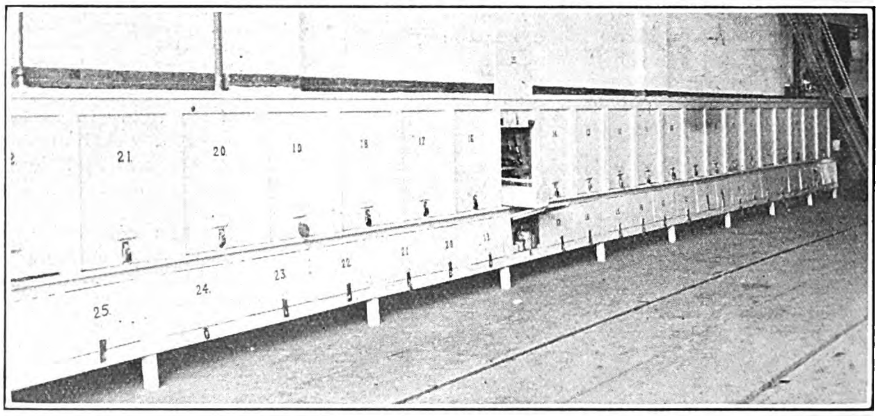
The boring bar has a micrometer adjustment for the cutting tool, so that accurate boring is assured. A bushing is provided in the jig for the bottom end of the boring bar to prevent chattering and insure accurate alignment.


19½"
18¼"
⅝"
14½"
1¾"
2¼"
2¾"
5"
23½"
5,⅝" Dowels to keep ring in right position on turntable
Tapped for 5,⅝" cap screws to hold ring on turntable

Ring Fixture for Holding Housings Accurately During Boring Operation



Boring a Pinion-End Housing in the Utica Park Shops of the New York State Railways



This Cabinet, Built Along a Wall of the Carpenter Repair Shop in Dallas, Provides a Place for Workmen to Keep Tools and Supplies

Cabinet for Workmen's Tools and Supplies

By J. L. Brown
Master Mechanic Dallas Railway, Dallas, Tex.

SUPPLIES, tools and tool boxes used by carpenters in the car repair shop usually present a difficult problem from the standpoint of keeping the repair shop looking neat and clean. At the same time, some provision must be made to give these men a place to lock up tools that are their personal property or that are assigned to them. As a result, tool boxes or cabinets are sometimes scattered about near the jobs on which men are working, and continual vigilance is necessary to prevent a very disorderly general appearance.

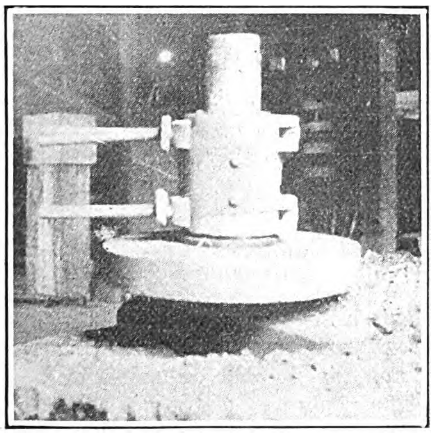
Some time ago the tool cabinet shown in the accompanying illustration was built in the shops of the Dallas Railway. Each of the compartments is in two sections. The larger one, above, is used for tools, while the smaller cabinet, below, is used for storing screws and other miscellaneous supplies that have been drawn out of stock for a particular job.

The cabinet is built along the wall at one side of the repair shop, where it is readily accessible and handy for the men working on cars in the shop. Each section is provided with locks, so that the contents cannot be disturbed.

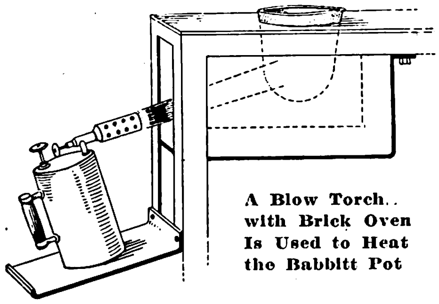
By insisting that men keep their supplies in the lockers provided for them, the general appearance of the shop is improved very much over previous conditions. The total cost of building the cabinet was small and is considered well justified from the standpoint of good housekeeping.

Babbitted Bearings Give Long Life

SIMPLE apparatus for rebabbitting bearings has given satisfactory results on the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y. Because this company operates a total of only about 25 cars the expense of installing elaborate equipment for babbitting would not be justified. A gasoline blow torch mounted on a shelf alongside the babbitting table is used to heat the metal. The latter is contained in a babbitt pot of the ordinary type suspended by its upper rim from the surface of the table. Thus the lower part of the bucket extends under the table, where a fire-brick oven has been constructed on a shelf. An opening in the fire brick allows the flame of the blow torch to be directed against the under part of the bucket. The arrangement of this apparatus is shown in an accompanying diagram.

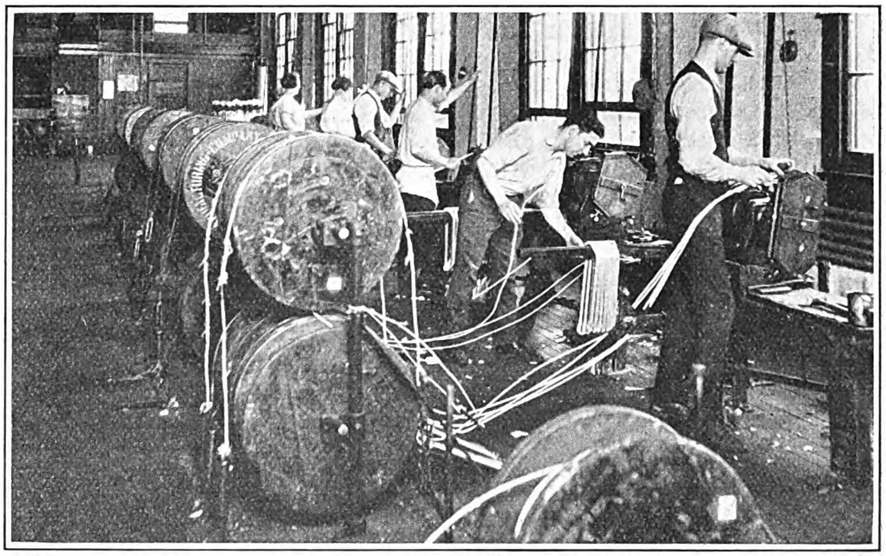


Bearings Removed from the Mandrel by This Clamp Are Immediately Quenched



A Blow Torch with Brick Oven Is Used to Heat the Babbitt Pot

A hinged holder has been arranged to fit around a bearing to be babbitted. The latter is slipped down over a mandrel and held in place by the clamp as shown in an accompanying illustration. Handles are provided so that the babbitted bearing can be removed from the mandrel and immediately quenched in a tub of water standing alongside. Bearings rebabbitted in this way give an average life of 75,000 miles, approximately as good as that of new bearings.



Wire Is Kept Under Tension in Rewinding Armatures in the Homewood Shops of the Pittsburgh Railways

Keeping Tension on Armature Wire

COILED steel springs arranged as shown in the accompanying illustration are used in the Homewood shops of the Pittsburgh Railways to keep tension on the wire used in winding armatures. This wire is carried on reels mounted on horizontal rods. A double set of reels is used, one above the other. These are arranged in groups of two, three or four, according to the type of armature. The wires pass through a series of pulleys and then through a spacing rod. The pulleys are fastened to the floor by the springs, and similar springs are attached to bands passing over the reels. With this arrangement the winder must pull the wire against a steady but slight resistance. The reels are prevented by the braking device from revolving too rapidly and allowing the wire to slack off.

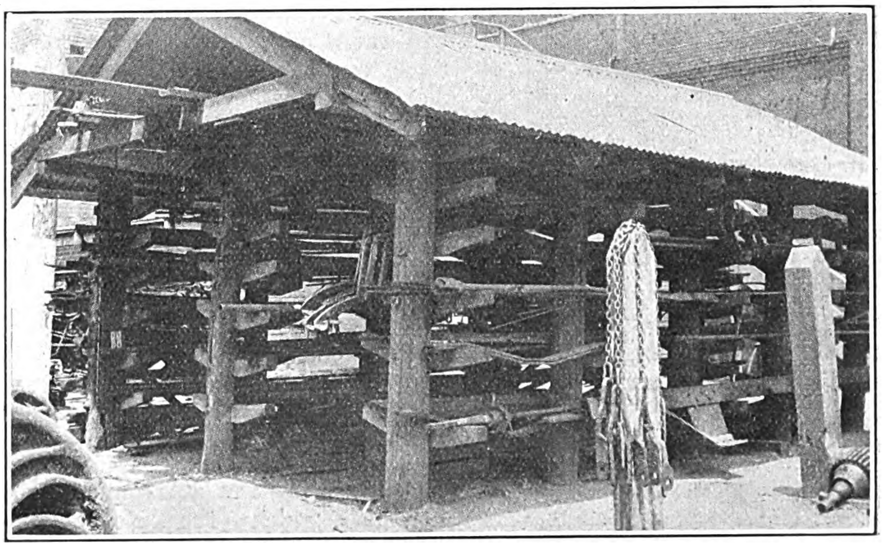
Outdoor Storage Rack for Bar Stock

By J. T. Porter

Master Mechanic Northern Texas Traction Company, Fort Worth, Tex.

STORAGE of bar stock usually takes a considerable amount of valuable space in the average railway blacksmith shop or storeroom. In addition this material is difficult to store so that it is readily accessible.

In the accompanying illustration



This Outdoor Storage Rack in Fort Worth Provides a Convenient Place for Storing Bar Stock and Spare Car Parts is shown an outdoor set of racks which have proved convenient in Fort Worth. A number of wood posts are set into the ground in the shop yard immediately back of the blacksmith shop and covered with a corrugated iron roof on a rough frame. Wooden cross-members are bolted to each post and extend out on each side so as to provide storage space for a large amount of material. In addition to bar stock, these racks are used for spare pull rods, brake beams, hand brake staffs and other parts which usually present an awkward storage problem.

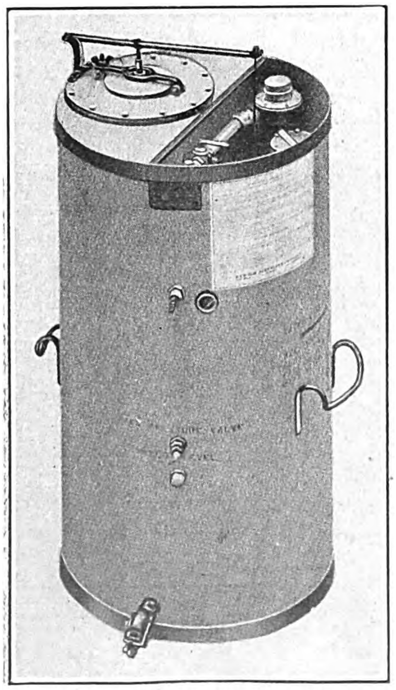
New Equipment Available

Portable Acetylene Generator

A SMALL generator to produce acetylene at low pressure for welding and cutting has recently been developed by the Oxweld Acetylene Company, New York, N. Y. This supplements a line of larger generators which are used to supply pipe lines in electric railway shops where much cutting and welding is done.

The new generator takes 35 lb. of carbide at one charge and can be transported readily from place to place, thus providing a portable supply of generated acetylene gas. Empty, the generator weighs 210 lb.

An entirely new principle of feed control is used which might be called a "heavier-than-water" float. A vertical partition, extending nearly to the bottom into a water seal, divides the generator shell. One side is gastight and contains the carbide hopper at the top. The upper part of the other side contains gas regulating and protective devices and an automatic carbide feed control. Generation of the first acetylene causes water to rise on this side of the partition high enough to all but submerge a pan full of water, hung to a control lever. This pan acts normally as a weight acting counter to a spring, but as the water rises about it, its apparent weight is diminished and the carbide hopper valve is closed by the action of the spring. As acetylene is drawn off, water rises in the gas compartment and correspondingly lowers under the float, relieving some of the buoyancy under the water pan, which, gathering weight with the receding water, depresses the spring and allows a small amount of carbide to drop into the generator and restore equilibrium.


Acetylene Generator Takes 35 Lb. of Carbide at One Charge

Because of its low center of gravity, the generator rights itself when tilted at an angle of 30 deg. It works perfectly at an inclination of upward of 10 deg. No adverse effects result if a generator is knocked over while in operation. Nearly all fittings are inclosed in the cylindrical shell and there is practically nothing projecting which may be injured by a fall on a concrete pavement.

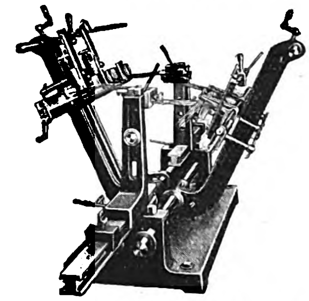
This generator has been submitted to the Underwriters' Laboratories, Inc., and has been listed by them as an acceptable device for installation.

Switchboard Instruments

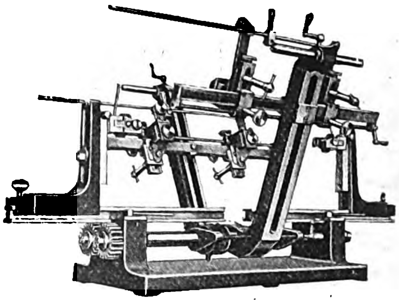
TWO new lines of direct current panel-type instruments for switchboard mounting have been brought out by the Roller-Smith Company, New York, N. Y. These instruments include milli-ammeters, voltmeters, milli-voltmeters and volt-ammeters. Type TD instruments are 3½ in. in diameter and type F instruments 4½ in. in diameter. They employ the d'Arsonval mechanism, which the Roller-Smith Company has brought to a high degree of refinement.

Improved Armature Coil Spreader

IMPROVEMENTS have been made in the Segur armature coil spreader and the new machine is now being placed on the market by the Electric Service Supplies Company, Philadelphia, Pa. An improved design for the coil blocks and end supporting knuckles enables the machine accurately to duplicate the angular relation of the slot portion of the coils. The parts are lever operated, which does away with loose parts, such as bolts, pins, toggles, etc. The supporting knuckles have adjustable side plates made of fiber. These can be renewed when necessary. The coil blocks are adjustable for both height and width of coils and are made entirely of steel, case hardened at wearing points. One movement of a single arm controls both coil blocks, either front or back, thus reducing the number of operations.


Spreader with Coil in Position after Being Spread

The holding plate of the coil blocks is within the operator's control at all times and is arranged so that loops can be spread before varnishing where this is desired. Authorities, however, have recommended that loops be varnished and baked before spreading, as this process toughens the cotton or silk insulation. The coil-forming device is adaptable for practically any standard type of coil, and the improvements reduce the number of hand operations.


Improved Coil Spreader in Open Position

The News of the Industry

Nine Cents Cash in Cincinnati

Initial Fare Fixed for New Franchise Under Which Cincinnati Street Railway Will Operate

Six tickets for 50 cents, or a 9-cent cash fare, has been agreed upon by representatives of the Cincinnati Street Railway and the Council committee on street railroads as the initial fare to be provided for in the new traction franchise. While the new proposal with its amendments will likely be passed by Council on July 1, its provision will not become effective until Oct. 1.

The conferees also have agreed that approximately $300,000 will be set aside each year from the earnings of the company for the redemption of $3,000,000 reducible capital, so that at the end of ten years the permanent capital of the operating company will not exceed $25,000,000, the amount set by the Mayor's Citizens Traction Committee. A tentative draft of the provision relating to the amortization of the $3,000,000 reducible capital has been presented to the city administration. The provision in substance sets forth that whenever the fare control fund exceeds $400,000 the excess, unless otherwise ordered by the Director of Street Railroads, shall be placed in a separate fund to be controlled by two trustees, one to be selected by the director and the other by the operating company. The trustees are to purchase capital stock of the company in the open market in an amount not to exceed $300,000 in any one year. The stock so purchased is to be canceled.

TRAFFIC FALLING OFF

It has been announced that the 7½-cent fare agreed upon in the franchise rejected by the Mayor's committee cannot be accepted as the initial rate of fare at this time. That fare was predicated upon the assumption that the franchise would be in operation on Jan. 1 of this year and that because of the reduced fare the number of riders for the year would probably run to a total in excess of 103,000,000 revenue passengers.

Failure of the committee at the last moment to agree to the terms of the proposed franchise continued the Cincinnati Traction Company as the operating company and also a 10-cent rate of fare. As a result there has been a steady decrease in the number of revenue passengers. If the same ratio of decrease is continued the aggregate number for the year will not exceed 95,000,000.

The amortization for the reduction of the capital is a modification of a suggestion made by A. E. Anderson of the citizens' committee and former City Solicitor Saul Zielonka. That the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad may be brought into the heart of Cincinnati over the tracks of the Cincinnati Street Railway has been announced as a possibility by Samuel Assur, representing the railway. However, Mr. Assur said that this matter depended upon the proposed franchise being ratified by the City Council and that the street railway again assumes operation of the service system.

Stockholder Acts to Protect Nashville Property

M. S. Adams, Mobile, a stockholder of the Nashville Railway & Light Company, has brought suit to have declared unconstitutional and void the law enacted in 1925 by the Legislature abolishing the operation of one-man cars in the cities of Tennessee with more than 30,000 population. The complainant alleges that compliance with the act would severely affect his interests in the defendant corporation and his property rights as a stockholder. He filed the bill as a matter of self-protection. If the Nashville company obeys this act, the complainant asserts, it must retire from service ten cars at a loss of approximately $60,000, remodel 36 other cars at a cost of $15,000 and purchase eight new cars at a cost of $88,000. The answer of the company was filed at the same time as the complainant's bill. It admits the truth of his allegations, another of which is that the classification of cities sought to be fixed is "arbitrary and capricious."

Detroit Dismissals Reviewed

Messrs. Schram, Merritt and Wilcox Out of Municipal Railway—Mayor and Schram Issue Contradictory Statements

Acting on instructions from Mayor John W. Smith, the Street Railway Commission at Detroit dismissed Ross Schram, general manager of the Department of Street Railways, and also removed I. N. Merritt as auditor. Col. H. U. Wallace has been made general manager, but the position of auditor has not yet been filled. Announcement of these changes was made on June 5. The same day C. E. Wilcox resigned as claims attorney.

According to a statement given out by Mayor Smith following the commission's action the resignation of Mr. Schram was asked because of "inexperience and inefficiency" and because Mr. Schram did not have the true picture of the transportation situation in Detroit. The earnings of the D. S. R., according to the Mayor's statement, have been steadily decreasing. This was attributed by Mr. Schram to the fact that industrial conditions have been bad. The Mayor denied this was true and cited that the earnings of the jitneys and of the Detroit Motorbus Company have been steadily increasing, while the revenue from car riders has been falling off.

The city's chief executive stated that he is responsible to the people for the operations of the street railways, but that he knew no more about the inner workings than the most disinterested citizen, because Mr. Schram and Mr. Merritt had constantly shown themselves unable to work with him and with the Common Council and because they had neglected to furnish him with reports which he had repeatedly requested.

Mayor Smith further cited that only recently Mr. Schram employed a firm to audit the D. S. R. books without consulting the chief executive, and that courtesy due the office of Mayor had not been extended by Mr. Schram or Mr. Merritt. He further charged that both had shown lack of ability to get along with the men working under them and with the City Council.

In commenting upon the action which they took at the Mayor's request, one of the street railway commissioners stated that he believed Mr. Schram was doing a good job as manager of the D. S. R. The reports of the department showed it to be on a sound financial basis. Commissioners Barlum and Esselstyn comprised the majority that removed Schram and appointed Colonel Wallace. The third member of the commission, E. Ogden Ellis, is in Europe. Mr. Esselstyn was appointed to the commission by former Mayor James Couzens and Mr. Barlum was named by Frank E. Doremus when he was Mayor.

Mr. Schram's removal from the position as general manager has been considered inevitable ever since last November, when Mayor Smith was elected. The Mayor kept in mind the desirability of persuading the existing commission if possible that Mr. Schram's removal would be for the good of the service, without making any change in the personnel of the commission.

Upon being requested to resign Mr. Schram asked that an audit be made of the D. S. R. accounts. This proposal was agreed to by the commissioners. He will aid the new general manager in taking hold of affairs.

Mayor Smith's statement of June 5 follows:

> The resignation of Mr. Schram was asked because of inexperience and inefficiency, and because Mr. Schram did not have the true picture of the transportation situation in Detroit.

> The earnings of the D. S. R. have been steadily decreasing and Mr. Schram has attributed this to the fact that industrial conditions have been bad. This is not true. The earnings of the jitney buses and the Detroit Motorbus Company have been steadily increasing, while the revenue from car riders has been falling off.
>
> I am the chief executive of the city and the one who is responsible to the people for the operations of this railway line, and I know no more about its inner workings than the most disinterested citizen. This is because Mr. Schram and Mr. Merritt have constantly shown themselves unable to work with me and with the Common Council, and because they have neglected to furnish me with reports which I have repeatedly requested.

In reply Mr. Schram said:

> As a matter of fact, I frequently went to the Mayor's office to consult with him, to ascertain his wishes, and to offer to give him any information he desired. To this the Mayor has invariably replied, with a grin: "The commission is running the street railway. I know nothing about it."
>
> When I sought to lay a serious problem before him, so that he could intelligently co-operate in its solution, the Mayor would continue his grin and his silence, reserving any comments he may have had for the political supporters who were continually urging him to get rid of me, as he had promised them he would do. He was so busy looking for a successor to me that I could not get him to concentrate on important matters having to do with the street railway, and it appeared futile to try to get such concentration from him. About all the contact the department was able to have with the Mayor was through his secretary.
>
> The Mayor refused time after time to approve of the minutes of the meetings of the Street Railway Commission, and I received a letter from him saying he was not going to approve them. He deliberately shut himself out from any information he needed to know about what the D. S. R. was doing.

The *Free Press* said in part:

> Ross Schram was given a place under the Street Railway Commission not in the least because he was considered specially qualified by experience or ability for the executive jobs he successively held. If Mr. Schram now has lost his place partly as a result of a turn of the political wheel he has no legitimate grounds for complaint. There is no record of brilliant achievement which indicates his elimination from the scheme of municipal operation is going to be a loss to the city if an ordinarily competent man has been chosen as his successor. The new general manager can make himself *persona grata* with the general public by seeing that something better than cattle car accommodations are henceforth provided in exchange for the fares collected.

The *News* said in part:

> Inexperience and inefficiency are broad charges. The first could be applied to the Mayor himself, who never held a city office before his election. If he considers inexperience in itself a valid ground for ousting a public servant, Mayor Smith should resign, for his experience is less than Mr. Schram's by several years.
>
> Financially the city's railways are in an enviable position, and they are giving excellent service at a rate of fare considerably lower than that charged in most other cities, while the employees draw the highest pay in the country.
>
> The reason for Mr. Schram's dismissal is not "inexperience" or "inefficiency." It is politics, and Mayor Smith would have been honest if he had said so. It is the only reason by which he can defend his action. And that reason is indefensible.

Conference on Bus Seniority

At a recent conference between John K. Punderford, president of the Connecticut Company, New Haven, Conn., and the members of the trolleymen's wage conference board negotiations were started for the settlement of the wage controversy and establishment of an understanding relative to the operation of buses. The men have explained that they want the company to recognize the seniority rule in the selection of drivers for the buses. Employees charge that the company has been engaging bus drivers who have never before been in the trolley service. Under the seniority rule employed by the company the men who have served the longest terms are given preference in the selection of lines over which they operate. Mr. Punderford declined to comment upon his view of the seniority rule as applied to the buses.

Wage Scale Renewed at Chicago

The Chicago Surface Lines and its employees have entered into a new contract continuing the wage scale of 75 cents an hour. The negotiations were carried through to a settlement harmoniously after the union, through William Quinlan, president of Local 241, had asked for 80 cents and many changes in working conditions. The company offered 70 cents.

The new contract continues an arrangement made by an arbitrator three years ago which brought the wage up to the present figure on a sliding scale. The arbitration ended a three-day strike.

The Surface Lines submitted that prices are lower now than they were three years ago, when the men walked out, and that to grant the figure of 80 cents would be impossible because it would mean an increase over the present fare of 7 cents.

The company agreed to arrange night runs, as far as possible, to end at 7 o'clock in the morning or earlier.

The settlement virtually fixed the scale for the Chicago Rapid Transit Company, operating the elevated lines.

Board Ends Grand Rapids Controversy

The board of arbitration which has been hearing evidence in a controversy between the Grand Rapids Railway, Grand Rapids, Mich., and the local division of the Amalgamated over six cases of dismissal has rendered its decision. Four probationers and two old employees had been dismissed from the service and the union protested, charging discrimination and seeking their reinstatement. The company based its action on its responsibility to patrons and assurance of safety to the public.

In dealing with the probationers' case, the arbiters' decision was that conductors, motormen and operators who are serving the 90-day probationary period are not entitled to full protection of the contract between the company and the union employees. The decision advises the agreements with the company by both the union and the employees' association be amended to forbid soliciting probationers for membership to avoid irritating rivalry.

In the case of a man with 29 years' service, the arbitrators substituted for discharge a suspension of 30 days without pay for colliding his car with a city tractor, and in the case of a platform man of two years' service, dismissed for calling a fellow employee "a scab," the board reinstated him, but imposed in place of discharge suspension for fourteen days without pay.

The board of arbitration said that the maintenance of adequate and careful service was essential.

Union Willing to Arbitrate in Davenport

The suggestion that arbitration be entered into between the men and the Tri-City Railway, Davenport, Iowa, made by representatives of the union in conference with R. J. Smith, general manager, has been adopted.

The union has addressed a communication to Mr. Smith announcing its willingness to accept the working agreement offered by the company on May 28, provided that it carries a clause covering the scale of wages now in effect. The union has submitted a tentative arbitration agreement to the company providing that the board shall agree upon the wages to be paid the men, including trainmen and shopmen, and that any awards shall be retroactive to June 1. The agreement also provides that the board shall be selected in the same manner as the one which was in effect June 1, 1922, to May 31, 1923.

In Illinois a slight increase will be asked, possibly to 60 cents an hour. The present rate is 58½ cents.

Two Arbitrators Chosen for Boston Arbitration

Fred A. Cummings, vice-president of the Eastern Massachusetts Street Railway, Boston, Mass., has been appointed arbitrator for the company in the negotiations looking toward a new wage agreement. James H. Vahey has been selected by the carmen's union to act as arbitrator for the employees. The third man has not been agreed upon.

The wage scale of employees of the Eastern Massachusetts Street Railway expired on May 1, 1925. The present scale, in cents per hour, is:

First three months	52.5
Next nine months	55.5
Thereafter	58.0

One-man car operators, 5c. an hour extra.

These rates became effective May 2, 1923, and were to have expired May 1, 1924. On July 2, 1924, however, they were renewed for another year.

The men are asking for an increase in the basic rate from the present level of 58 cents to a new one of 70 cents. The present level was incorrectly given in ELECTRIC RAILWAY JOURNAL, issue of May 30, page 864. The men are asking that the differential in favor of the operators of one-man cars be increased from the present rate of 5 cents to a new rate of 8 cents, so that if the request were granted about 95 per cent of the carmen in the employ of the Eastern Massachusetts would be drawing 78 cents an hour. All demands are merely bases for negotiations and it has not been agreed yet what to submit to arbitration.

Pittsburgh Sells 31,000 Weekly Passes

Reports for the first week of Pittsburgh's $1.50 weekly pass, started Monday, June 1, show a sale of more than 31,000. The sale of the 25-cent Sunday passes good for the same area exceeded 29,000 despite the fact that the weekly pass includes Sunday.

Paving Restrictions Modified in Charleston

Onerous paving requirements have been removed at Charleston, S. C., by the adoption by the City Council of a resolution from the ways and means and streets committees and the board of public service granting a petition of the Charleston Consolidated Railway & Lighting Company asking that it be relieved of street paving and maintenance costs, except as damage be done to the paving by the operation of the cars. Originally the company was required to pay for paving between its tracks and 3 ft. on each side, but by an amendment in 1922 the bearing by the company of the cost of such work was reduced to one-half. The resolution adopted follows:

> Whereas the Charleston Consolidated Railway & Lighting Company, successor to the Charleston City Railway, has petitioned City Council that:
>
> 1. The company be relieved of further charges for new paving or replacement of existing paving.
>
> 2. The company be relieved of the cost of maintaining paving along its tracks, except insomuch as such paving is destroyed or damaged by the operation of its cars or the maintenance of its tracks, and
>
> Whereas conditions of travel and paving have materially changed since the granting of the franchise in 1897, and
>
> Whereas City Council is desirous of relieving the railway of any unfair or undue hardship: therefore be it
>
> *Resolved*, That section 11 of the franchise of the Charleston City Railway, dated March, 1897, as amended on Oct. 10, 1922, be further amended so the same shall read as follows:
>
> Section 11. The Charleston City Railway shall at all times keep the space between the tracks and for 3 ft. outside in good repair, so as to conform to the condition of the balance of the streets upon which the road runs, except in such cases where, in the opinion of the company, damage or expense is not caused by the company, its cars or its tracks, then such expense be referred to the city engineer for his decision as to whether due by the company or not, but the decision of the engineer shall be reviewed by the Board of Public Service, and its finding and decision shall be final and binding on the company. In case any streets now unpaved or paved shall be paved or repaved, the said company shall bear and pay the city all added or additional expense which shall be incurred in paving such streets by reason of and due to the presence of the tracks of the company upon such streets, and generally, except where otherwise provided for in this grant, shall observe and obey the regulations, enactments and provisions contained in the General Ordinances of the City of Charleston, with reference to street railroads and the ordinances to be hereafter ordained amending the same.

City Holds Up Chicago Elevated Improvement

Plans prepared by the Chicago Rapid Transit Company for the extension of station platforms to permit the operation of longer trains are being delayed in their execution because the city has not yet granted permits for the extension of platforms on the loop. Unless authority is granted to extend the loop platforms, the west side lines would not get the benefit of longer train operation, as the platforms on the inner loop tracks are not of sufficient length to accommodate longer trains. The city administration has said that the permits on the loop will not be issued unless the company consents at its own expense to remove its columns from the street and place them on the curb line.

In that connection it is pointed out by the company that the original plans of the engineers provided for columns placed at the curb lines. The property owners refused to give frontage consent under those circumstances and in that they were supported by the then city administration and Council. The city ordered the company to place the supporting columns in the street and it had to comply if the loop was to be built. At that time there were few if any sub-basements under the sidewalks and the placing of the supports on the curb line would have been a comparatively simple problem. Today there are many basements under the sidewalks and this would make the relocation of the columns a difficult and expensive engineering problem.

Georgia Interurban Seeks Higher Fare—Opposition Intense

Suspension of service on the Atlanta Northern Railway, an interurban line running between Atlanta and Marietta, Ga., looms ahead for the second time as a result of opposition to a proposed increase in passenger rates asked of the Public Service Commission. The first public hearing on the increase in fare was held before the commission on June 4. It resulted in a heated argument between Preston S. Arkwright, president of the Georgia Railway & Power Company, which owns the road, and Judge Newt Morris, Marietta, who opposed any increase in the present rates.

In the opening statement before the commission Mr. Arkwright stated that during 1924 the Atlanta Northern fell more than $80,000 short of making an 8 per cent return on its actual investment and asked an increase of 1 cent for each zone—an increase from 6 to 7 cents—making a total increase of 7 cents between Atlanta and Marietta. He stated that the increase had been approved by a committee representing the Marietta City Council and the Chamber of Commerce, and that the increase in cost of commutation ticket books was only $1.50—from $8.50 to $10.

Judge Morris charged that the Georgia Railway & Power Company collected numerous charges from the Atlanta Northern Railway, including $38,000 for power, $45,000 for the rent of tracks and facilities, $8,000 for carhouse employees and $6,000 for station employees, in addition to taking 5 cents out of each fare for the transportation of passengers over the streets of Atlanta. He said these charges caused the books of the Atlanta Northern to show a loss for the year rather than a profit.

Following statements by Judge Morris that the Georgia Railway & Power Company had "terrorized" the people of Marietta into eliminating jitneys by suspending operations, Mr. Arkwright refused to answer any more questions on the part of Judge Morris, and Chairman Trammel of the commission abruptly closed the hearing.

Should the decision be adverse, the Atlanta Northern may suspend operations a second time, as railway officials have plainly indicated that they will not continue to operate the line at a loss. Should the increase be granted, it will be applied in the hope that operation at a profit may be achieved.

South Jacksonville Celebrating Successful Operation

South Jacksonville, Fla., is rejoicing again. The occasion this time is the anniversary of the opening of the railway a year ago. The record of the year shows that 800,000 passengers were carried and that approximately 10 per cent profit was made on the original investment. The city officials of South Jacksonville express their appreciation of the co-operation by officials of the Jacksonville Traction Company, which operates the road under contract. No damage case of importance was reported during the year.

The opening of an electric railway line owned by the city and operated by the Jacksonville Traction Company was celebrated by South Jacksonville on May 15, 1924. The service was the culmination of a two-year effort on the part of the people to secure railway service. At that time $100,000 in municipal bonds was voted by the citizens of South Jacksonville as the amount necessary to build the line to the corner of Hendricks Avenue and Pine Street.

The construction contract was let to Stone & Webster. City Engineer J. L. Crary acted as supervisor. By careful use of the funds the construction was accomplished for $73,000. This included an additional 1,156 ft. of track, bringing the car line to the corner of Atlantic Boulevard and Hendricks Avenue.

Since the installation of the service the tracks have been extended and are soon to be carried to the corner of Kings Road and Atlantic Boulevard. There is a car every fifteen minutes. The fact that only four cars are available has prevented the shortening of the schedule.

Paving Controversy in Ohio City

Bankruptcy for the Springfield Street Railway with consequent municipal operation is certain if the paving program contemplated by the city of Springfield, Ohio, for this summer is carried out. Paul C. Martin, president of the railway, in a statement issued June 10, declares that the proposed street improvements will involve expenditures of $100,000 by the company at a time when every monthly report of operations records a loss.

Robert W. Flack, city manager, declared that some satisfactory solution of the matter would be reached. Under the terms of its franchise the company is guaranteed a return of 6 per cent on the total value of its property, failing which, the lines may be taken over by the city if the company so elects. Mr. Martin declares the company does not wish to give up the property unless forced to it by additional financial burdens.

Contractors assert that a possible compromise will be reached by permitting the railway to retain old bases, ties, tracks, etc., and simply resurface its section of streets to be paved.

Some months back the company elected, under the terms of its franchise and provisions in its contract with the platform men, to establish one-man car service on most of the lines. Eighty per cent of the cars are being operated with one-man crews except during rush hours.

Recent Bus Developments

Boston & Maine Plans White Mountain Service—New York State Railways Starts Resort Service

THE Boston & Maine Transportation Company, the subsidiary to handle the bus line business of the Boston & Maine Railroad, announces plans for operations between Boston and the White Mountains and between Boston and Portland, Me., possibly to go into operation by July 1.

The motor coach routes projected in New Hampshire are intended to provide service in new territory or to extend or supplement service now given by passenger trains of the Boston & Maine Railroad. It is reiterated that there is no intention to operate buses on lines paralleling the railroad in commuter zones. The lines for which approval of the New Hampshire commission is asked are: Plymouth to Lincoln, Franklin and Franklin Falls to Bridgewater, Concord to Dover and Concord to Sunapee and Newport, N. H.

The Boston & Maine Transportation Company is to operate motor coaches on the Boston-Portland run and in a service to the White Mountains, it is announced, "in an effort to determine for itself and for the public the extent to which such services may offer attractions not presented by the railroad, and the extent to which such services may be developed along sound, economic lines."

The coach service which the Boston & Maine Transportation Company is to substitute for the passenger trains on the York Harbor & Beach Railroad is expected to start on June 22 between Portsmouth and York Beach, with stops at the important seacoast towns and villages along the route. Within a week or two of that time it is expected that this service will be extended further between Ogunquit and Wells, as previously announced.

The Wisconsin Power & Light Company will operate one of its coaches, now in interurban service, on a daily trip, starting at 2 p.m., around and about Madison, Wis. This will be a sightseeing trip covering about 25 miles. Attractive circulars have been issued by the company describing the local tour plan.

The New York State Railways has opened bus service on three lines connecting Rochester and three lakeside summer resorts. The routes are to Island Cottage from the Dewey Avenue bus terminal for a 35-cent fare; from the city to Manitou Beach, via the Ridge Road and passing through Greece and Hilton, for one-way fare of 70 cents, and from the end of the Dewey Avenue feeder bus line to Grand View Beach for a one-way fare of 45 cents. Regular schedules are maintained from 7 in the morning to 10 in the evening, with additional service on Sundays and holidays. The bus system along the Lake Ontario shore is operated by the railways' subsidiary, the Rochester Railways Co-ordinated Bus Lines, Inc.

With the purchase of the Ridge Road line from Buckley Brothers for $15,000, the last obstacle in the path of the bus system project was removed. The Ridge Road line was a bone of contention for months, as the Hilton Town Board refused to grant the railway a franchise in competition with the Buckleys and consequently held up the project until the purchase on May 26.

Pending the arrival of six Bender bodies from Cleveland, the company is using rolling stock it had on hand and the four White buses it acquired with the purchase of the Ridge Road line from Buckley Brothers. The service extends over 36 miles in all and in the main supplants the service given by the abandoned Rochester & Manitou Electric Railway. Transfers are issued to city trolley lines.

The Nueces Railway, Corpus Christi, Tex., recently received two Reo buses to be operated in supplementary service.

The Illinois Commerce Commission has authorized the East St. Louis & Suburban Railway to replace its Oakland Street car line in Belleville, Ill., with buses. The company has been using buses on the Oakland line for about a year. The bus service has proved so satisfactory to all concerned that it has been decided to go through with an agreement reached a year ago to dismantle the car line.

The Mid-State Coach Lines, the bus company operated by four Central New York trolley corporations, has opened service in Auburn to supplant the abandoned Seymour Street trolley line section and serving an area in West Auburn hitherto not directly reached by trolley lines. This line is one of several to be installed by the company to cover other sections of Auburn.

The Knoxville Power & Light Company, Knoxville, Tenn., is considering the use of buses to suburban districts.

Permission to establish a coach line to serve the south side in the Grant Park section of Atlanta, Ga., has just been granted the Georgia Railway & Power Company by the Atlanta City Council. The service will be similar to that established some months ago in the Morningside and Sylvan Hills sections not reached by street cars. Under the terms of the permit, a 10-cent fare will be charged for rides on coaches or combination rides on coaches and street cars. Transfers will be issued from bus to car and from car to bus, but in the latter instance must be accompanied by 3 cents, bringing the total up to 10 cents. The interchangeable fare arrangement is, however, only temporary and will in no way affect routes to be established later and which will extend to the center of the city.

The Board of Public Utility Commissioners has authorized the Ocean City Electric Railway to discontinue service on its crosstown line, Ocean City, N. J., and to substitute bus service thereon. Evidence indicated that the railway was financially unable to restore its track to proper operating condition.

The Durham Public Service Company, Durham, N. C., through R. L. Lindsey, vice-president, has laid before the City Council a proposal to motorize the entire Lakewood Park-Mangum Street line, one of the two main lines of the Durham system, serving all the northern and all the southwestern sections of the city. The Council has referred the matter to the utilities committee. Bus lines are already in operation in West Durham and over much of north central Durham and the Club Boulevard section. They are also being operated on the Chapel Hill Street section during the construction of the Chapel Hill Street underpass, which blocks railway traffic to that end of town.

The Syracuse Railway Co-ordinated Bus Lines, Inc., has applied to the Common Council of Syracuse, N. Y., for a bus permit to operate from Syracuse to Chittenango.

The Alexandria & Suburban Motor Vehicle Company, subsidiary of the Washington-Virginia Railway, Washington, D. C., has received provisional permission to operate buses in the District of Columbia over a specified route leading to Alexandria, Va. Interstate business only is allowed. The grant is not effective unless the Corporation Commission of Virginia issues a certificate for operation in that state.

The Union Traction Company of Indiana expects to ask for the abandonment of one city line in Marion, Ind., in favor of bus service. Officials contend the line does not pay and the company's finances are not in condition to permit it to make repairs.

The St. Louis Bus Company, controlled by the reorganization committee of the United Railways, St. Louis, Mo., has requested the St. Louis Board of Public Service to authorize a new bus line that will form a loop with five street car lines in the southwestern section of St. Louis. The permit, if granted, would enable the St. Louis Bus Company to operate in a territory that is now served exclusively by the People's Motorbus Company. Part of the route sought is over streets now used by the rival bus company. Transfer privileges will be granted between the cars and the new bus line. The People's Motorbus Company is expected to oppose this line vigorously.

Officials of the Waterloo, Cedar Falls & Northern Railway have noted that since the Rainbow Drive has been paved there has been an increase in the popularity of the buses between Waterloo and Cedar Falls, Iowa. So much are the buses favored that the railway plans to discontinue the half-hour service between the cities of Waterloo and Cedar Falls and operate only once an hour. It is the intention of the company to serve patrons between the two cities exclusively with buses after 7:15 p.m.

A petition of the Rockford & Interurban Railway for permission to operate interurban buses into Rockford, Ill., on North Second Street was presented recently to the City Council.

Freight Delivery Planned in Eastern Massachusetts

The Boston & Worcester Street Railway is planning an extensive door freight delivery to cover practically every city and town in eastern Massachusetts. In Lowell, Lawrence, Andover, Haverhill and Boston the system was tried during 1924 and was reported favorably. It is planned to make door-to-door delivery along the entire system. Shipments west of Boston will be delivered to the exact address within 24 hours of their receipt at the forwarding station.

Election at Decatur Next Step

W. A. Baehr, president of the Illinois Power & Light Corporation, has approved the final draft of the railway franchise for Decatur, Ill. Nothing now remains but to pass the ordinance and call the necessary election for the approval of the voters. More than a month ago the Illinois Power & Light Corporation and the city reached an agreement on the terms. When the final agreement was reached several changes were incorporated in the final draft and were submitted to the Illinois Power & Light Corporation for final approval. The most important addition to the franchise, patterned after the old franchise which expired in 1921, is the section giving recognition to the bus. It provides that the company, with the sanction of the City Council, may substitute buses for street cars on any existing line for a period of six months, subject, at the conclusion of that time, to a vote of the people. The franchise is for twenty years.

Ten Cents in Plattsburgh

An order was issued by the Public Service Commission on June 5 authorizing the Plattsburgh Traction Company to increase its fare from 7 cents to 10 cents on one day's notice. Three tokens will be sold for 25 cents good within the city limits. It was shown at the hearing that the road had long been operated at a loss by the Delaware & Hudson Company and that it was bought in April by two Plattsburgh bankers to save it from being abandoned. It is estimated that the 10-cent fare will provide sufficient revenue approximately to meet expenses without paying any return on the investment.

St. Louis Promulgates Downtown Parking Rules

Downtown parking is prohibited in St. Louis, Mo., effective June 23, between 7 a.m. and 10 a.m. and 4 p.m. and 6 p.m. by an order issued by the Traffic Council on June 4. The ruling holds for 90 days, after which it must be adopted as an ordinance by the Board of Aldermen. All but commercial vehicles are affected, the limit for these being fifteen minutes. The Council also stipulated designated parking spaces for intercity bus lines. No other vehicles will be permitted in such spaces. The intercity buses will not be permitted to discharge or take on passengers in St. Louis except at the spaces named and at certain points.

News Notes

Ten-Cent Fares Continued. — An order was issued by the New York Public Service Commission on May 29 permitting the Westchester Street Railroad to continue in effect the present 10-cent fare schedule in each of the six zones until Dec. 1, 1925. The communities through which the company operates have consented to the continuation. The order affects the Tarrytown, Silver Lake, Scarsdale and Mamaroneck Avenue lines.

Third Arbiter Chosen.—Thomas J. Williams, a conciliator for the federal Department of Labor, was recently designated by Secretary of Labor Davis the third member of a wage arbitration board that will settle the differences between the Scranton Railway, Scranton, Pa., and its employees. Secretary Davis was asked to name the umpire on the wage arbitration board when representatives of the company and the union failed to come to an agreeable selection of a third man. The two other arbiters who will take part in this issue are John M. McCourt for the company and L. F. Hart for the men. At a special meeting of the union workers held a week ago the employees voted to prolong arbitration and continue at work. The union workers originally asked for a general increase of 16 cents an hour for all employees. If granted the 16-cent boost it would bring the hourly rate of motormen and conductors up to 80 cents. The wage contract expired on April 1.

Conference Considers Charges.—At the conclusion of a conference between city officials and officers of the Louisville Railway, Louisville, Ky., it was declared by the president of the Council that Louisville would continue to operate on a 6-cent fare. This apparently is the result of the conference called to discuss with officials the contents of a resolution passed by the General Council censuring railway officials for alleged extravagances in the management of the company. Everything contained in the report of the Utilities Bureau to the Board of Works was gone over at the conference. Others at the meeting would make no statement other than that nothing had been accomplished.

Passes for All Time.—The weekly pass has been adopted for use indefinitely by the Utah Light & Traction Company of Salt Lake City, Utah, after a trial period of several months.

Power Dispute Terminated.—The city of Toledo lost its final battle to collect alleged overcharges by the Toledo Edison Company for current used by the Community Traction Company in operation of railway lines in Toledo when the Supreme Court of Ohio, on June 3, sustained motions for the two companies to dismiss the appeal on error taken by the city attorneys. City officials, when W. E. Cann was street railway commissioner, claimed that the Toledo Edison Company had collected $300,000 too much in power charges. The question of the future rate is now before the Public Utilities Commission. Voluntary reductions in the power rate were made several months ago by the company so that the dispute is practically a closed incident. Action of the Supreme Court closed the courts as a means of determining power rates under the Milner service-at-cost ordinance.

New Routing in Pawtucket. — Pawtucket, R. I., recently installed a loop system whereby practically all crosstown lines have been eliminated by the United Electric Railways. With the start of the new routing the system of fare payment has been changed so that no fares are collected in the center of the city, inbound fares being taken as the passengers enter and outbound passengers paying as they leave the cars. This is expected to speed up car movement in the center of the city.

Contract Submitted. — Mayor Kendrick of Philadelphia, Pa., recently submitted to the Council with a message an ordinance authorizing the execution of a contract, the parties being the Philadelphia Rapid Transit Company, Philadelphia City Passenger Railway, West Philadelphia Passenger Railway, the Philadelphia Traction Company and the Union Traction Company. The new contract is supplemental to an agreement entered into on Feb. 2, 1925, between the city and the Philadelphia Rapid Transit Company for the leasing by the city to the Philadelphia Rapid Transit of a two-track surface car subway in Chestnut Street proposed to be constructed by the city.

Jitneys Must Cease.—By an act of the City Council of Savannah, Ga., the jitneys will pass out as a means of public transportation in that city on Oct. 1. The Savannah Electric & Power Company, which runs the railway in Savannah, said it would have to reduce service in Savannah and into the suburbs unless it was protected from unfair competition. Jitneys began running in Savannah six or seven years ago.

One Fare Zone Eliminated. — The Public Utilities Commission has granted the application of the Newport Electric Corporation, Newport, R. I., to create a neutral zone in Tiverton by which one fare zone will be eliminated between Tiverton and Fall River and the operation of trolleys, buses or both between Tiverton and Newport was approved. Some months ago the company was granted permission to substitute buses for trolleys between Newport and Tiverton during the period from Sept. 1 to June 1, continuing the electric railway from the Stone Bridge to Fall River. Now the company can run either trolley or buses as the traffic warrants.

Date for Trial Fixed.—The United States District Attorney at Buffalo has tentatively fixed June 22 as the date for the first of the series of trials of executives and members of the Amalgamated Association under indictment on charges of conspiracy in connection with the dynamite outrages on the Buffalo-Niagara Falls high-speed interurban line at Elwood during the strike of 1922. All of those indicted in the last report of the federal grand jury have been taken into custody.

Financial and Corporate

Purchase Details Stated

Basis of Acquisition of Virginia Railway & Power Company by Stone & Webster Made Public

Frank J. Gould, until recently owner of the controlling interest in the Virginia Railway & Power Company, Richmond, Va., sold his holdings at a flat price of $100 a share for the preferred stock and $120 a share for the common. The agreement made at the time of the sale of the majority shares gave Richmond stockholders the privilege of disposing of their stock at the same price. A number of stockholders are said to have taken advantage of the offer, with the Virginia Trust Company, Richmond, as clearing agent. All stockholders who desire to sell have been asked to present their stock, signed and stamped ready for transfer.

The total stock held by Richmonders is said to be approximately $750,000 in common and $2,000,000 preferred. The outstanding capital stock of the company is $9,000,000 preferred and $12,000,000 common. Mr. Gould had owned the controlling interest since the organization of the present company in 1909.

The controlling interest was purchased by a syndicate composed of Stone & Webster, Inc., Chase Securities Corporation, Blair & Company, Inc., and Blodget & Company. The sale was brought to a successful close recently after Charles A. Stone had returned from Paris, where preliminary steps were arranged with Mr. Gould for the purchase of his interest. Several other Virginia properties have also been taken over by the syndicate.

The properties are located in a prosperous section of the Roanoke and Rapidan Valleys, where the company furnishes electric light, power and railway service to Richmond, Norfolk, Petersburg, Portsmouth and other communities, and does the entire gas business in Norfolk. There are five generating stations, including both steam and hydro-electric, with a capacity of 140,000 hp., and the company owns valuable undeveloped water-power sites on the Rapidan and Roanoke Rivers. The purchase also includes the Spotsylvania Power Company, which serves Fredericksburg and owns several valuable power sites on the Rappahannock River. The properties will be under the executive management of Stone & Webster, Inc.

Mr. Stone, in a statement made on June 8, said:

> It has been felt for some time that Mr. Gould might consider selling his interest in the Virginia public utilities, and we feel that we are very fortunate in successfully making the purchase. We are very glad to have the opportunity to assist in the development of this part of Virginia. The policy of the new owners will be to render first-class service, to co-operate fully with the customers, the general public and the authorities, and to provide extensions to the plants and other facilities as rapidly as is necessary to keep pace with the growth of the community served.

On June 10 the Virginia Railway & Power Company announced an issue of $2,660,000 first and refunding mortgage 5 per cent bonds, offered by Stone & Webster, Inc., Blodget & Company, and Blair & Company, Inc., together with $486,000 Virginia Railway & Power Company-Norfolk & Portsmouth Traction Company first mortagage 5 per cent bonds, both at 98½ and interest. These offerings are part of the issues now outstanding and do not represent new financing. Both issues are the direct obligation of the company.

Council's Offer for Rainier Line Submitted

A formal offer of $1,000,000 in utility bonds made by the City Council of Seattle, Wash., recently for the Seattle & Rainier Valley Railway has been transmitted to M. C. Sampsell, Chicago, president of the company. Walter M. Brown, resident manager at Seattle, states that should the city's offer be satisfactory the proposition will be submitted to the bondholders for ratification.

Following the action of the City Council in making the formal offer, opponents of the deal began to agitate a movement for a referendum. No definite steps will be taken, however, until the Council, by ordinance, shows it intends to complete the purchase.

The Rainier Valley line consists of about 25 miles of tracks and 32 cars. Originally, the company asked $1,500,000 for the system. The line is the only privately owned railway in the city, the major system having been purchased by the city in 1919 from the Stone & Webster interests of Boston for $15,000,000.

Baltimore Valuation Hearing Resumed June 16

Testimony in the hearing before the Maryland Public Service Commission to fix a valuation on the property of the United Railways & Electric Company, Baltimore, during last week was principally confined to the question of "going value." Witnesses for the railway, including heads of various departments, were called upon to substantiate the claim made by the company that the "going value" was $16,000,000.

Some testimony also was heard in regard to rerouting, but the commission held that the company would not be forced to make any extensive studies of this subject until after a fair valuation was determined. Joseph A. Stoll, superintendent of traffic, was one of the witnesses who testified as to rerouting. It is claimed by Clarence W. Miles, people's counsel, that rerouting would save considerable money.

Following the hearing held on June 5 the case was adjourned until June 16. At that time the United will present testimony in regard to the weekly pass. Mr. Miles petitioned the commission several days ago to order the company to show cause why it should not put this weekly ticket plan into operation.

Final Hearings Held

Minnesota Commission Expected Shortly to Announce Rates of Fare in Minneapolis and St. Paul

Rates of fare on the St. Paul City Railway and the Minneapolis Street Railway will be announced by the Minnesota Railroad and Warehouse Commission early in July. After a final hearing of one day the commission had the figures submitted by the railways to bring their valuations to date. Valuations already announced by the commission for the two properties were not of even or recent dates. The temporary rate of fare in both cities is 6 cents flat with universal transfer. Each company is asking a 7-cent fare. In case of disapproval by either the cities or the railways of the permanent rates made by the commission appeal is allowable to the district courts.

At the hearing the Minneapolis company held that its property had increased in value from Jan. 1, 1922, to Jan. 1, 1925, $1,832,867, bringing the total to $27,178,948. The city held the increase was only $306,554. The commission had fixed the valuation as of Jan. 1, 1922, at $25,346,081. The St. Paul company held its property had been increased in value $206,019 from the valuation of $15,998,849 as of Jan. 1, 1924, as fixed by the commission, or to a total of $16,204,868. The city put the increase at $167,650.

PERMANENT FARE RATE AGITATED

For the first time since the rate hearings began two years ago the matter of permanent rate of fare was brought up at the hearing ended on June 2. D. J. Strouse, comptroller of the Twin City Rapid Transit Company, said that to earn 7.5 per cent on the valuation of $27,165,396, the expected rate of return to be announced by the commission, the company in Minneapolis will need a fare of 6.6 cents. To continue the improved service of 1925 the company will need 6.61 cents fare, and if it is to make improvements in 1925 of 4.86 per cent over the 1924 standard as required by the city ordinance of 1920 the fare must be 7.16 cents. The city maintained the company can show a profit at the present rate of fare.

In St. Paul a fare of 7.38 cents would be necessary to secure a return of 7½ per cent. Earnings in St. Paul have been decreasing. The city contends that if the amount claimed by the company for depreciation is reduced and cost of the valuation proceedings is spread over ten years the company will be able with a 7-cent fare to make extensions and lay pavements. The city wants the depreciation charge reduced from $350,000 to $150,000 and suggests the valuation expense of $300,000 be charged off at the rate of $30,000 a year.

The April report of the St. Paul City Railway shows a net loss of $15,987. For four months the operating income was $228,803, compared with $233,961 for the similar period in 1924. The passenger revenue declined from $421,594 in January to $353,292 in April, 1925. For the four months the company earned 4.2 per cent on the commission's valuation figure.

Surplus in Omaha

Decrease in Number of Passengers and Passenger Revenue—Higher Fare Allowed

Passenger revenue of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the year 1924 compared with 1923 shows a decrease of $193,544, or 4.80 per cent. The decrease in number of passengers was porportionately greater, but the increased fare in Council Bluffs and on the bridge line, put into effect on Aug. 3, partly offset the diminished travel. The company attributes this falling off in travel to the increased use of automobiles. It says this was shown conclusively during the severe weather in December, 1924, when traffic increased over December, 1923.

Revenue from other operations shows an increase of $35,770 for the year, but non-operating revenue shows a falling off of $13,547.

Operating expenses decreased $191,113, or 6.16 per cent. Of this amount $47,500 represents a reduction in the sum set aside for depreciation. Approximately $20,000 represents a saving in the price paid for coal and a lessened consumption of power, and the remainder is due to smaller amounts expended for maintenance of cars, track and roadway, etc., and to a reduction in the car-miles operated. For injuries and damages a somewhat smaller sum was also required than for 1923.

Expenditures for renewals and replacements were rather large during the year. Expenditures for actual additions to the property on the contrary were small, but charges for betterments representing improved construction of replacements were considerable.

Expenditures for renewals and replacements of the leased lines in Council Bluffs were $243,463. The major charge to this account was that part for the reconstruction of the Missouri River bridge, which was in the nature of replacement rather than addition.

After a hearing before the Nebraska State Railway Commission on the company's request for a reconsideration of certain elements of value in the commission's valuation finding, the commission increased the value of the company's property in Nebraska for rate-making purposes from $13,800,000 to $14,100,000. This does not purport to be the full value of the company's property, but is merely the value for rate-making purposes. Other assets would bring the total value to a considerably higher figure.

In August the company increased the local fare in Council Bluffs from 5 cents to 7 cents cash or four tickets for 25 cents, after obtaining a temporary order in the United States District Court restraining the city of Council Bluffs from interfering with the raise in fare. At the same time the rate for a 30-ride commutation ticket between the two cities was increased from $1.50 to $2. The city of Council Bluffs has taken an appeal to the United States Circuit Court of Appeals. If this court sustains the lower court, the District Court will proceed to take evidence through a special master as to the value of the railway property in Council Bluffs, the revenues received and the operating expenses and determine whether the new rates of fare yield more than a reasonable rate of return on the fair value of the property used in giving service. The opinion expressed in the report was that on the merits of the case the rates would be sustained.

INCOME ACCOUNT OF THE OMAHA & COUNCIL BLUFFS STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1924

Revenue from transportation:		
Passenger revenue	$3,836,694	
Special car revenue	1,435	
Mail revenue	185	
Miscellaneous transportation revenue	4,114	
Total revenue from transportation		$3,842,428
Revenue from other railway operations		499,045
Gross railway operating revenues		$4,341,473
Railway operating expenses		2,913,817
Net operating revenue		$1,427,656
Taxes assignable to railway operations		446,395
Operating income		$981,261
Non-operating income:		
Net income from miscellaneous physical property	$859	
Income from funded securities	4,696	
Income from unfunded securities and accounts	16,466	
Miscellaneous income	872	
Total non-operating income		22,893
Gross income		$1,004,154
Deductions from gross income:		
Rent for leased roads	$60,500	
Rent for leased roads, interest on funded debt	90,400	
Miscellaneous taxes	7,990	
Interest on funded debt	469,390	
Miscellaneous debits	5,641	
Total deductions from gross income		$633,921
Net income		$370,233
Dividend on preferred stock—5 per cent	$200,000	
Profit and loss adjustment—credit	125,748	74,252
Surplus for the year		$295,982
Surplus Jan. 1, 1924		306,277
Surplus Dec. 31, 1924		$602,259

The Nebraska State Railway Commission has since authorized the company to advance its fare on the Omaha lines.

Value of Capital Traction Increased

As the result of a decision by Justice Adolph A. Hoehling of the District Supreme Court the valuation of the Capital Traction Company, Washington, D. C., will be increased from $17,500,000 to more than $28,000,000. The decision was handed down on June 8.

John H. Hanna, vice-president and general manager of the Capital Traction Company, said that the carfare would not be affected. Further, that while increasing the value would tend to make the company's rate of return much lower at the present fare, the company has no plans for seeking a change.

The addition made by Justice Hoehling was $5,150,000. This sum was claimed as an addition to valuation by the company as representing the franchise, good will and other intangible values involved in the purchase of the old Washington-Georgetown Street Railway. The commission had refused to allow it as part of the calculated value of the Capital Traction Company's property. The decision directed the commission and the company to submit to Justice Hoehling their respective calculations of the value of the physical plant of the corporation, using current prices instead of the prices at which the materials and services were paid for in its construction.

While Justice Hoehling was making his decision on June 8, the commission decided that $23,067,000 was its calculation of the value of the physical property in the light of present-day prices. The company has decided, it was reported, to name as its view of this value $25,700,000. Choosing between these two estimates, the court cannot fix the physical value at less than $23,000,000, but since Justice Hoehling has already decided to include the intangible values, the new valuation cannot be less than $28,000,000 and may be $30,700,000 if the judge uses the company's estimate instead of that of the commission. It is said that the commission will appeal from the ruling of Justice Hoehling, although no decision had been made as yet to do so.

Rumored Sale of Annapolis Road

Local investment bankers in Baltimore, Md., continue to watch with interest the movement of the securities of the Washington, Baltimore & Annapolis Railway. Bonds of the company have been in demand since talk was heard of a new deal, in which the electric road would be a conspicuous figure. At the present price the yield is attractive and in any new merger or other proposition, it is explained, the bonds would probably be allowed to run to maturity, as refinancing could hardly be accomplished on a more favorable basis than the present one.

In this connection reports still persist that a deal involving a change of control of the electric line may soon develop. The rumors have, however, been denied by officials of the railway, as well as of the Western Maryland Railroad and J. E. Aldred, chairman of the boards of the Consolidated Gas, Electric Light & Power Company of Baltimore and the Pennsylvania Water & Power Company.

The common stock of the company touched 12¼ on the Baltimore exchange a few days ago. This compares with 5⅞ a few weeks ago. Bidding for the shares was spirited, and it was reported that some sizable blocks changed hands. As on recent days, buying was chiefly for out-of-town account, although local operators continued to add to their holdings.

Sale of Indiana Line Ordered

Sale of the property of the Beech Grove Traction Company, operating between Beech Grove and Indianapolis, Ind., 4 miles, at a price of not less than $30,000 has been ordered by the judge of the Circuit Court in Indianapolis. The sale will be held on June 22. The property is to be sold as a whole and not in parcels. The Fletcher Savings & Trust Company was named receiver for the road in November, 1917. According to Donald S. Morris, trust officer of the company, the receiver has been compelled to advance money for rebuilding the line and supplying a number of new cars. Receivership liabilities now total $30,000. Approximately $100,000 in bonds is outstanding.

Tax Appraisals Cut in Indiana

The State Tax Board of Indiana has just finished its work with interurban railways. An average of reductions shows 21.43 per cent less than for 1924. One of the members of the board said:

> I doubt whether the interurban lines would sell today for the amount at which we have appraised them. In the last year several traction companies in the state have gone into the hands of receivers. A number of short-haul lines have been discontinued. Hardly any are paying dividends on stock. There is perhaps a single company in the state which is making any profit.
>
> We could not set the valuation of these lines any lower and do justice to the taxpayers. It is to be hoped that regulation of bus lines under the new law and the continued efforts of interurban officials will result in interurban lines getting on their feet.

Net Income Falls Off.—The Eastern Massachusetts Street Railway, Boston, Mass., reports revenue for April of $752,929, against $805,699 during the corresponding month a year ago. The expenses were $586,452 in April of this year against $612,595 during April, 1924. The net income in April, 1925, was $58,559, against $79,123 a year ago.

Reorganization Seems Assured.—It is said that 85 per cent of the sinking fund bonds, 90 per cent of the 7 per cent notes and 66 per cent of the stock of the Denver Tramway, Denver, Col., have been deposited with the various protective committees and that it is almost sure an early announcement will be made that the tramway is out of the hands of a receiver and the new officers elected. Claude K. Boettcher, chairman of the joint reorganization committee, is in the East and upon his return a further statement may be forthcoming.

Deficit in Youngstown in April.—The Youngstown Municipal Railway, Youngstown, Ohio, in April showed a deficit of $7,859, the largest of any month thus far this year. The deficit represents the difference between expenditures of $175,867 and gross income of $168,008. Of the total income $126,962 was from street railways and $41,046 from buses. The report showed total mileage of 476,405, divided between cars, 331,276, and buses, 145,129. The total number of passengers carried on car and bus was 2,643,151. The present deficit in the stabilizing fund is $1,263,062.

Insulls Get Maine Property.—The Middle West Utilities, Chicago, Ill., an Insull corporation, has contracted for the purchase of the Central Maine Power Company, a consolidation of gas, electric and railway companies in Maine. The purchase will be through a $3,500,000 sale of common stock which will be delivered in Augusta, Me., about July 1, by Walter S. Wyman, an officer of the Maine corporation. The Insulls will pay about $140 a share. Included among the properties of the company are electric railways which operate 23.92 miles of track.

Reject Saltair Resort.—Members of the City Commission of Salt Lake City, Utah, recently forwarded to H. J. Grant, president of the Mormon Church, a letter declining the offer of the church to give Saltair Beach and the Garfield & Western Railroad to Salt Lake City. The commissioners expressed appreciation of the magnanimity of the church in offering the resort, but expressed regret that the city found itself facing financial difficulties which in the judgment of the commission would render it inadvisable for the city to undertake to take over and handle such a resort. The famous Saltair Resort is 15 miles west of Salt Lake City. Most of it was destroyed by fire on April 22. The property was offered to the city, with the idea of the city rebuilding the structure, which would have cost in the neighborhood of $250,000. An offer of $75,000 to the Mormon Church for the property was rejected.

131,200 More Shares of Public Service Common.—The Public Service Corporation of New Jersey, Newark, will shortly issue and sell to stockholders 131,200 additional no-par-value shares of common stock. Holders of the 8 per cent preferred, the 7 per cent preferred and the common will be entitled to subscribe to one share of the new stock for each 10 shares held at $62.50 a share. The privilege applies to stockholders of record of June 5, and subscriptions will be payable not later than Aug. 1.

Slight Increase in Income Available for Charges.—The Santa Barbara & Suburban Railway, Santa Barbara, Cal., reports to the Railroad Commission its 1924 operating revenue as $137,053 compared with $144,815 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $103,755 and for 1923 as $113,382, leaving a net operating revenue of $33,298 for 1924 and $31,432 for 1923. During 1924 taxes charged to operation were $10,769 and for 1923 $10,485. Deducting the taxes leaves operating income of $22,528 for 1924 and $20,946 for 1923. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus of $22,528 for 1924 and $20,951 for 1923.

Book Reviews

1924 Proceedings of National Association of Railroad and Utilities Commissioners

Two volumes in one, containing the proceedings of the thirty-sixth annual convention held in Phœnix, Ariz., Nov. 11 to 14, 1924, and the proceedings of the National Conference on Grade Crossings held in Chicago, April 30 and May 1, 1924. Published by the National Association of Railroad and Utilities Commissioners, J. B. Walker, secretary, 270 Madison Avenue, New York. $5.

By invitation, several representatives of the great public utilities of the country addressed the Phœnix convention. Among them were: H. C. Abell, president, and Alexander Forward, secretary-manager of the American Gas Association; William Sproule, president of the Southern Pacific Company; J. N. Shannahan, president, and J. P. Barnes, vice-president of the American Electric Railway Association; M. H. Aylesworth, executive manager of the National Electric Light Association; Carl D. Jackson, special counsel of the National Electric Light and American Gas Associations; Eugene S. Wilson, vice-president of the American Telephone & Telegraph Company; Fred B. MacKinnon, president of the United States Independent Telephone Association. The addresses of these leaders in their respective industries will be found in full in this volume.

The Phœnix convention adopted a series of resolutions bearing on the amendment of the transportation act of 1920, so as to define more clearly the powers of the states. The subject was also covered in the address of H. G. Taylor of Nebraska, the retiring president of the association. Both will be found in this volume.

In the 1924 volume also will be found an address on "The Labor Investment in the Railroads," by Donald R. Richberg of Chicago, counsel for the railroad brotherhoods, and an address by Dr. E. A. White, director of the committee on the relation of electricity to agriculture. Major Alexander Forward's address on the prospects of fuel scarcity contains some startling facts and predictions.

Other subjects covered are: Car Shortage Problem, Federal and State Regulation, Public Utilities under Regulation, Standardization of Accounts, Safety of Operation, Railroad Valuation, Express Companies, The Labor Investment in Railroads, Public Ownership and Operation, The Grade-Crossing Problem, Motor Vehicle Transportation, Amendment of Transportation Act, Rates and Service, Telephone Depreciation, Uniform Regulatory Laws, Fuel Resources Imperiled.

Electric Railway Practices in 1924

Summary of most significant features of presentations made by electric railways Aug. 15, 1924, to the Charles A. Coffin Foundation. Edited by Henry H. Norris for the Foundation. Published by the American Electric Railway Association, New York, 1925. 179 pages. Illustrated.

Nine electric railway companies made presentations of their practices for the Charles A. Coffin prize during 1924. These presentations have been digested in book form, so that those interested in the industry may easily obtain a summary of methods. The information has been grouped in nine chapters, each devoted to some subject related to electric railway practice, and the method followed by each company as described in its presentation is given in that chapter. The chapter headings follow: Tendencies in Rolling Stock Practice, Improving Service Quality and Quantity, Advertising the Service, Fostering Good Public Relations, Relations Between Management and Employees, Progress in Accident Mitigation, Cutting Construction and Maintenance Costs, Economical Administration and Financial Structure of Electric Railways.

The book is uniform in style with "Electric Railway Practices in 1923," and is well illustrated. It should offer many helpful suggestions on modern methods which have proved successful on numerous electric railways.

Municipal Ownership

By Carl D. Thompson. Published by Thomas Y. Crowell, New York. 445 pages. $3.

Carl D. Thompson, the author, is secretary of the municipal ownership league of America. He has set out to survey publicly owned utilities and to forecast the future. His publisher says in the blurb on the book that the chief purpose is to present an impartial survey of what has actually been done in the field of public ownership of public utilities.

Of this book of 445 pages only 28 are devoted to municipal street railways. This seems in some respects disproportionate. The treatment is patchy rather than profound. The author says "we have in America not only numerous smaller cities owning and successfully operating municipal street railway car lines but three of our large cities." It is true that some of these cities have done well in running the roads, but whether they have been a success depends on what one means by success. Still, this is not an occasion to cavil. The book deserves the careful attention of all students of public utility problems.

To get back to the beginning, Mr. Thompson first discusses the "limitations of municipal ownership"—showing how it logically embraces basic industries only and not all utilities. Then comes a chapter on the "Extent, Growth and Success of Public Ownership." Under "Familiar Forms" are discussed schools, libraries, postal systems, etc. The question of the ownership of railroads, steamship lines and of means of communication next comes in for discussion. This is followed by "Mines and Mining," "Electric Light and Power," "Water Works," "Street Car Lines," "Gas Plants," and similar utilities. There are chapters on the Ontario Hydro-Electric System and Public Super-power, the latest development in the field of electric utilities; also sections on the Canadian Government Railway and the Alaskan Government Railroad. As is indicated previously, a final chapter is devoted to "Objections to Public Ownership," in which, by the question and answer method, the whole subject is reviewed and an effort is made to meet some of the objections often urged against municipal ownership.

Facts and Figures of the Automobile Industry

Published by the National Automobile Chamber of Commerce. 1925 edition. 96 pages.

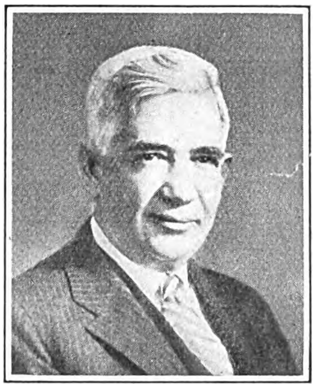
This is the sixth annual edition of "Facts and Figures of the Automobile Industry." The book aims to compile in ready reference form the essential data on the status and development of motor transportation, including such topics as production, registration, railroad traffic, uses of motor cars, highways, legislative principles, trucks, bus and taxi statistics and the relationship of rail, water, electric and motor transportation.

Personal Items

New Detroit Manager

Colonel Wallace, Successor to Ross Schram, Has Entered Upon His New Duties

Col. H. U. Wallace is the new general manager of the Detroit Department of Street Railways, Detroit, Mich., succeeding Ross Schram. Back of him is 30 years of engineering and railroading experience. He has expressed his determination to give the car riders in Detroit the best possible service as cheaply as possible, keeping in mind that it will be his bounden duty to protect and conserve the great investment which the people of Detroit have in the municipal street railway system.


H. U. Wallace

Since January, 1924, he has been assistant general manager of the Knoxville Power & Light Company, with direction of all of that company's activities. He supervised the reorganization of the railway department of the company and is said to have put that department on a self-sustaining basis.

During the war he was commissioned as Major of engineers and assigned to the construction division as supervising constructing officer of a large number of the most important ordnance plants. After the armistice, his rank having been raised to Lieutenant-Colonel, he had charge of dismantling all ordnance construction work and was discharged from the army on March 1, 1919. After being engaged with his father on water-power development in Georgia he became assistant general manager of the Arkansas Central Power Company in charge of operation.

Colonel Wallace was born in Rock Island, Ill., in 1872. He is the son of John Findley Wallace, chief engineer of the Panama Canal under President Roosevelt. He was graduated from Purdue University and in 1894 was engaged as assistant engineer for the Illinois Central Railway. During his years of service with that railroad, of which his father was general manager, he was resident engineer in charge of the Illinois Central's lake front improvements, roadmaster of the Chicago division, roadmaster and assistant superintendent of the Louisville division and superintendent of the Louisville and Freeport divisions.

From 1903 until 1906 he was chief engineer of the Illinois Central in charge of all maintenance and construction work. He resigned in 1906 to become third vice-president of J. G. White & Company, New York, in charge of construction work. He was later general manager of the Chicago, Lake Shore & South Bend Railway, which he operated for eighteen months. He resigned this position to go into business as consulting engineer in Chicago. His return to active railroading was as vice-president in charge of operation and reconstruction of the Fort Dodge, Des Moines & Southern Railway.

In 1912 Colonel Wallace inspected the holdings of the Northern Colorado Power Company. As a result of his work on this property and the recommendations he made a new company, the Western Light & Power Company, was organized.

F. W. Webster Made Vice-President

Frank W. Webster, general manager of the Stockton Electric Railroad, Stockton, Cal., has been promoted with the title of vice-president and general manager of the Fresno Traction Company, the Fresno City Railway, the Stockton Electric Railroad, and the Visalia Electric Railroad. The properties are all controlled by the Southern Pacific Company. For more than ten years Mr. Webster has been the general manager of all the electric lines in the San Joaquin Valley affiliated with the Southern Pacific.

D. H. Braymer in Consulting and Sales Field

Daniel H. Braymer has resigned as editorial director of *Industrial Engineer*, a McGraw-Hill publication, in order to devote the major part of his time to the activities of the recently organized D. H. Braymer Equipment Company. He will retain his connection with the McGraw-Hill Company as consulting editor of *Industrial Engineer*.

Mr. Braymer's newly organized company will have its headquarters in Omaha, Neb. It will specialize in consulting and sales work associated with power applications in industrial plants, large buildings and power plants and will act as the authorized representative of several manufacturers of related power equipment in Nebraska and Iowa.

The career of Mr. Braymer fits him admirably for his new occupation. He was born in New York State and completed his engineering education at Cornell University. In 1915 he became associated with the McGraw-Hill Company as engineering editor of the

Electrical World and, with the exception of two years service as editor of the *Electrical Record*, he retained his association with the *Electrical World*, in later years as managing editor and co-editor. When the *Electrical Review* was purchased by the McGraw-Hill Company Mr. Braymer was placed in charge of both the publishing and editorial policies of its successor, the *Industrial Engineer*, with headquarters in Chicago.

Careers of Former Detroit Officials Reviewed

Ross Schram, succeeded as manager of the Department of Street Railways at Detroit, Mich., by Col. H. U. Wallace, was a former newspaper reporter selected as secretary by Mayor James Couzens in 1918. Prior to his connection with the street railway situation in Detroit Mr. Schram was engaged in publicity and advertising work for automobile companies. He also operated an automobile agency in Ottawa, Canada, but returned to Detroit in 1917 and again joined the Detroit *News* staff.

He obtained an intimate knowledge of the former Mayor's plans and policies during the municipal-ownership campaign. In addition to being secretary to the Mayor he was secretary to the first Street Railway Commission. After holding this position for several months he was made assistant general manager under Joseph S. Goodwin. Following Mr. Goodwin's death about two years ago, W. B. Mayo, chief engineer of the Ford Motor Company, was made general manager.

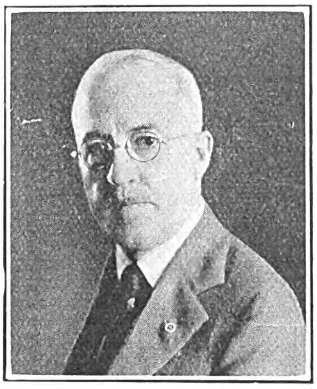
When Mr. Mayo resigned last June Mr. Schram was appointed general manager on Mr. Mayo's recommendation. At that time Mr. Mayo said that Mr. Schram's record entitled him to full credit and full responsibility. Not only that but the Street Railway Commission itself attributed much of the success that had attended the operation of the railway to the vigor and enthusiasm of Mr. Schram. He certainly possesses these attributes. They are essential to success in journalism, and Mr. Schram was a success at that, as was proved on many occasions in his handling of the work of the railway. At the time of his appointment to the post of manager last July Mr. Schram's career was reviewed at length in the ELECTRIC RAILWAY JOURNAL, special attention being given to his record with the railway. This sketch was accompanied by a portrait.

I. N. Merritt, former auditor of the Department of Street Railways at Detroit, began his career, strange as it may seem, in the shops of the Grand Trunk Railway in his home town, Battle Creek. It is said that after he had run a crane off the track he decided he was not fitted for a career in mechanics and so set off for college. After leaving college he went with the Burroughs Adding Machine Company in Detroit as cost accountant. In 1909 he returned to Battle Creek, where he assumed a position with the Grand Trunk System, but later in the same year he joined with several others and served as brakeman on the road for nine months.

In 1911 he went back to the Burroughs company, where he remained until 1914, when he accepted a position as cost man with the construction division of the Detroit United Railway, which was then operating the city railway lines now included in the municipal system. Mr. Merritt also was responsible for all building appraisal in connection with the Bemis appraisal work at Detroit. Feeling that he must know more about his chosen profession, accounting, he took up the study of commerce and finance at the University of Detroit, working during the day and attending class in the evening. Finishing his course in three years, he joined the firm of Thompson & Black, accountants, where he remained until 1920, when he joined the forces of the municipal railway. Mr. Merritt has been secretary of the Street Railway Commission as well as auditor of the D. S. R. He is only 34 years of age.

R. B. Campbell President Mid-West Association

At its recent meeting in Kansas City the Mid-West Electric Railway Association elected R. B. Campbell, secretary-treasurer and general manager of the Arkansas Valley Interurban Railway, president for the ensuing year.



R. B. Campbell

Mr. Campbell has been a member of the executive committee and vice-president of the association. His election as president marks another step in the progress of a career in the electric railway industry which began when the Arkansas Valley Construction Company was organized in 1909 to build the Arkansas Valley Interurban Railway. Mr. Campbell was first secretary and later became general manager of the railway.

Mr. Campbell is a native of Illinois, but has lived in Kansas most of his life. He was educated in Wichita, and his early experience was gained in the cattle business in which he was engaged for about fifteen years. Later he served in the Kansas Legislature as a representative from Mead County from 1902 to 1905. He also served two terms as City Commissioner of Wichita, from 1911 to 1915.

When the first unit of the Arkansas Valley Interurban Railway was completed in 1911, Mr. Campbell, as its secretary, got his first railway operating experience. In 1916 the construction was completed, and upon dissolution of the construction company, he remained in the railway field as secretary, treasurer and general manager of the interurban.

When the bus began to attract interest, Mr. Campbell saw the importance of linking it up in a constructive way with existing railway lines, and in December, 1924, organized the Arkansas Valley Transportation Company, of which he is president, to operate buses in the territory contributory to the Arkansas Valley Interurban Railway.

He has been active during the past year as a member of the legislative committee of the Mid-West Electric Railway Association, in which capacity he was instrumental in getting a bus regulatory law passed by the State Legislature during the last session.

George D. Fearman, formerly assistant secretary of the Dominion Power & Transmission Company, Hamilton, Ont., has been appointed secretary. In this new capacity he succeeds the late William Clarke Hawkins, who was also managing director.

J. R. Biedinger has tendered his resignation as structural engineer of the Rapid Transit Commission of Cincinnati, Ohio. Mr. Biedinger is considered one of the most valuable of the corps of engineers who have been employed by the transit commission. His resignation was the result of a desire to go into private practice.

William Chamberlain, general manager of Oldham Corporation Tramways, has been appointed general manager of Leeds City Tramways, Leeds, England, succeeding the late J. B. Hamilton.

E. B. Kessler has succeeded Ralph Peters as superintendent of the Long Island Railroad. In the issue of the ELECTRIC RAILWAY JOURNAL for May 16 it was inadvertently stated that Mr. Kessler would succeed Mr. Peters as president.

Albert Collier has resigned as secretary of the Georgia Public Service Commission. He had served that body for about seven years. No successor has yet been named to fill the vacancy.

John H. Porter is to be appointed by Governor Baker of Missouri a member of the Missouri Public Service Commission to succeed E. J. Bean of De Soto, Mo. The Governor recently made an announcement to this effect. Mr. Porter is a civil engineer and was graduated from the University of Georgia. During the World War he served in the Engineering Corps.

Richard W. Martin, Pittsburgh City Solicitor, was recently appointed by Governor Pinchot the seventh member of the Pennsylvania Public Service Commission. Mr. Martin was named to the vacancy on the commission caused by the failure to confirm the nomination of Commissioner Fred J. Miller, Center Bridge, Bucks County. If confirmed by the next Senate Mr. Martin would hold office until July 1, 1933. Mr. Martin was graduated from the University of Pittsburgh in the law department; he was admitted to the bar and became affiliated with John S. Weller, then a State Senator. Later he became active in Republican party politics in Pittsburgh.

Major G. H. Simpson, until recently director of public relations of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has resigned to accept a position with a Chicago advertising concern. Major Simpson became director of public relations for the railway in December, 1923. He founded the *Rylite Employees' News*, which has been issued for fourteen consecutive months.

Obituary

D. W. Ross

David William Ross, president of the United Collieries Company, formerly vice-president and purchasing agent of the Interborough Rapid Transit Company, New York, died on June 10. Mr. Ross was born at Mineral Point, Wis., 55 years ago. He entered the service of the Illinois Central Railway at the age of nineteen, remaining there for seventeen years. The last year he was general superintendent of transportation. He had long been associated with Theodore P. Shonts in railroad work. They worked together on the Panama Canal. When Mr. Shonts became president of the Interborough he invited Mr. Ross to join him. After leaving the Panama Canal Commission Mr. Ross served for a year as managing director of the Magnus Metal Company, New York, and then became vice-president of the Interborough Rapid Transit Company, the Interborough-Metropolitan Company, the Rapid Transit Subway Construction Company and a director in the New York & Queens County Railway. He later became vice-president of the New York Railways Company. He continued with the Interborough interests until the early part of 1920.

William E. Dowdell, for the past ten years superintendent of the Portsmouth Electric Railway, Portsmouth, N. H., a subsidiary of the Boston & Maine Railroad, died on June 5 at the Relief Hospital, Boston. Prior to his being appointed general superintendent he was assistant general superintendent of the line which operates from Portsmouth, Rye and North Hampton. Mr. Dowdell spent his early years on the sea, in which service he rose to a captaincy. Later he was employed by the Bay State Street Railway, going to Portsmouth in 1915 to succeed F. P. Fosgate.

William Clark Hawkins, secretary, managing director and chief engineer of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., died suddenly on May 11. In 1912 when Mr. Hawkins was general manager of the Dominion Power & Transmission Company he was elected managing director. In 1917 he was elected president of the Southern Canada Power Company. The Dominion Power & Transmission Company controls among other properties the Hamilton Street Railway, and the Hamilton Radial Electric Railway. In the old cable car days Mr. Hawkins was assistant engineer on the Third Avenue Road, New York.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Rules to Govern Purchases

At the convention of the National Association of Purchasing Agents, held in Milwaukee May 25-28, some recommendations were drafted as to the principles and plans of purchasing for state, county and municipal governments. The following procedures, taken from these recommendations, apply to purchases by corporations where there is a regularly organized purchasing department and will be of interest to utility purchasing agents:

1. Purchase requisitions covering materials or supplies not obtainable from any point from regular stock supply, properly approved by department head and covering complete description of material and specifications, are to be forwarded to the purchasing agent. These requisitions should describe but one class of material in accordance with storekeeper's standard classification, and should state whether funds are available in the budget to cover value of recommended purchase. Requisitions for replenishing stock items or additions to stock supply shall be sent by the storekeeper to the purchasing agent.
2. The purchasing agent is to obtain prices and close to the best advantage for material covered by requisition.
3. Orders should be written in four copies, the vendor receiving the original, the purchasing agent retaining the duplicate, the triplicate to be sent to the receiving or using department, the quadruplicate to the testing department.
4. Invoices are to be checked against order in the purchasing agent's office as to quantities, prices, f.o.b. freight allowance, terms, etc., and a record taken of the invoice.
5. The general storekeeper shall render to the purchasing agent each day a tally sheet itemizing quantities and description of items received, giving vendor's name, purchasing agent's order number and disposition.
6. Invoices, properly approved by the purchasing agent, should then be passed to the proper fiscal officer for payment, record having first been made of the date that each invoice was passed before expiration of discount period.
7. A suitable record indexed according to materials should be kept showing dates and quantities purchased as well as the price and discount.
8. The purchasing agent shall govern the sale of any and all scrap and surplus materials. A list of scrap and surplus materials should be submitted by the storekeeper.

Ohio Brass to Split Shares

Stockholders of the Ohio Brass Company, Mansfield, Ohio, have been asked to approve a split-up of present stock, two for one, exchange to be made with new no par common. The company has paid dividends on the common stock for 21 of the last 23 years without interruption. Net earnings for the three years ended Dec. 31, 1924, it was announced, averaged $6.49 a share on the company's no par value common stock to be outstanding after the proposed stock dividend.

The company has only $2,100,000 of preferred stock outstanding. It has no funded debt.

Bureau of Mines Transferred to Department of Commerce

President Coolidge by executive order on June 4 transferred the Bureau of Mines from the Department of the Interior to the Department of Commerce.

Two offices of the Bureau of Mines will remain under the Interior Department, those having to do with coal, oil and other mineral land leasing.

Secretary Hoover said that the Bureau of Mines was created as a service bureau for the mining industry and that it was his purpose to develop its activities. He said that he would soon appoint a committee representative of organizations of mining engineers and the mining industry to study ways and means to increase the efficiency of the Bureau of Mines and divisions of the Department of Commerce which do work of similar character.

In furtherance of the same purpose to combine all government business agencies under one head, the president some months ago transferred the Patent Office to Secretary Hoover's department, and other bureaus will be similarly treated when the required legislation is obtained under the reorganization act.

Complete Trade Statistics Make for Competition

As more opportunity is afforded for study of the Supreme Court's decision in the matter of trade statistics a very general conclusion is being reached that it is one of the finest definitions of law

Metal, Coal and Material Prices

Metals—New York	June 9, 1925
Copper, electrolytic, cents per lb	13.50
Copper wire base, cents per lb	15 875
Lead, cents per lb	8 40
Zinc, cents per lb	7 34
Tin, Straits, cents per lb	55 50
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	1 975
Pittsburgh mine run, Pittsburgh, net tons	1 95
Franklin, Ill., screenings, Chicago, net tons	2 125
Central, Ill., screenings, Chicago, net tons	1 775
Kansas screenings, Kansas City, net tons	2 625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6 25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2 20
Linseed oil (5-lb. lots), N. Y., per gal	$1 09
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0 1575
Turpentine (bbl. lots), N. Y., per gal	$1 01

in relation to economics that ever has been handed down by the judiciary. The court is as emphatic in its pronouncements against conspiracies to fix prices or to limit distribution as it is in pointing out that a statistic service is not such a conspiracy. The recent ruling claiming that trade statistics are not illegal was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of June 6, page 913.

One of the dangers of a decisive victory of this character, it is pointed out, is the encouragement it will give trade associations that are disposed to edge over the line. It is clear that the court regards secret statistics as being over the line. If the 95 per cent who never have made improper use of statistics are not to suffer again from the wrongdoing of a few, they should do all within their power to discourage any misuse of the function which has been stripped of uncertainty. The discussion of this subject for the past several years has had the effect of focusing public attention on these activities. Publication of all statistics is believed to constitute the greatest safeguard that can be set up.

The position of the court is regarded as a striking substantiation of the position taken three years ago. At that time Secretary Hoover, through a letter written to the Attorney-General, gave the country a comprehensive set of arguments showing that it was neither sound nor warranted to deny industry a statistical service. The Department of Commerce, in addition, took the position that complete statistics of prices of past transactions make for competition.

Exhibit Applicants for A.E.R.A. Convention Increase

Space applications for the October convention of the American Electric Railway Association have been out ten days. Up to the close of business June 10, 77 companies had applied for 42,743 sq.ft. of space. For the same period last year 45 companies had applied for 26,254 sq.ft. A little better than two weeks still remains in which to file applications so as to have them considered by the exhibit committee when it meets on July 1 to make the official space assignment. Application for space can be made to Fred Dell, director of exhibits, at association headquarters, 292 Madison Avenue, New York City.

Rolling Stock

Kansas City Railways, Kansas City, Mo., through Receivers Wilson and Fleming, awarded the contract for 25 single-deck, six-cylinder, 29-passenger buses to the Yellow Coach Company, Chicago, on June 10. Chassis for eighteen double-deck buses and five parlor buses were ordered from the Six Wheel Safeway Manufacturing Company, Philadelphia. All double-deck buses are to be delivered in St. Louis within 42 days and parlor cars within 49 days. All bodies will be built by one of two car companies in St. Louis, according to special designs of the Kansas City Railways. Single-deckers will have 230 in. wheelbase, air-operated front and rear doors and air brakes.

Track and Line

Northern Ohio Traction & Light Company, Akron, Ohio, will spend more than $1,000,000 in railway betterments. About 40,000 new ties are being placed on various sections. Extensive repair work is being done in Akron. The cost of building new track on four streets will be $300,000. Other repair work includes the double tracking of High Street in Barberton at a cost of $125,000. Improvements at Meyers Lake Park total $35,000. New tracks in Canton will cost about $150,000, with the double track between Canton and Massillon, practically completed last year, costing $28,000. In the city of New Philadelphia worn-out tracks are being removed and up-to-date tracks placed on steel ties and concrete construction are being substituted. The total cost of this improvement is $50,000. The sum of $7,500 is being spent in the raising of 2 miles of track between Midvale and Uhrichsville. Contemplated new tracks between Bedford and the city limits of Cleveland will cost $300,000.

Iowa Railway & Light Company, Cedar Rapids, Iowa, will pave between the car tracks at Third and Main Streets in Marshalltown, using Lumnite cement. This experiment in concrete paving will be watched with interest by the city administration.

Seattle, Wash. — The utilities committee of the City Council has approved an ordinance authorizing the extension of the Cowen Park line of the Seattle Municipal system from Ravenna Boulevard and Fifteenth Avenue northeast to the Bothell Road. The project will be financed by the sale of $72,000 interest-bearing railway warrants.

Municipal Railway of San Francisco, San Francisco, Cal., is extending its line into the Spring Valley Water Company property and the Ocean View tract by way of Junipero Serra Boulevard. The cost of this work will probably reach $265,000. The Spring Valley right-of-way is about 7,000 ft. long. It was donated to the city for the car line.

Nashville Railway & Light Company, Nashville, Tenn., will spend about $53,000 to reconstruct its tracks and pave between and for 2 ft. on each side of its double tracks on Fatherland Street from Second Street to Eleventh Street.

Power Houses, Shops and Buildings

San Francisco Municipal Railway, San Francisco, Cal., will have a new carhouse and shop at Bryant and Mariposa Streets, following the voting by the Board of Supervisors of $70,000 for the purchase of this block of land. The question has been under debate for one and a half years.

Key System Transit Company, Oakland, Cal., will spend about $300,000 in rehabilitating its power system in the East Bay cities of California. Work already started has for its object practically a complete revision and modernization of the method of carrying power from substations to the cars. The new power distributing system will not only take care of the normal increase in business, but will also make it possible to have ample power at full voltage applied to car motors, thus providing for quicker acceleration, faster schedule speed and consequent better service. The new Hobart unit will cost approximately $24,000.

Public Service Railway, Newark, N. J., recently received permission to construct a commercial garage at 222-38 Bloomfield Avenue, to house about 140 buses, and to cost approximately $150,000. This location was for many years the site of a carhouse built in horse car days. It is now occupied by an open store yard for cars and a small repair shop. The garage will be of modern construction and will be the headquarters of the Bloomfield, North Newark, Summer Avenue and Market line buses. Objections to the garage were overruled by the zoning commission, which held that the change would be an improvement and would tend to increase rather than depreciate property values in that section.

Trade Notes

Morton Manufacturing Company, Chicago, Ill., announces the appointment of the Peden Iron & Steel Company with offices in Houston and San Antonio, Tex., as its exclusive and direct representative covering the sale of its "Acme" line of railway appliances in the extreme southwestern section of the United States and Mexico.

American Appraisal Company, Milwaukee, Wis., has recently opened offices in Dallas, Tex., 612 Mercantile Bank Building, and in Kansas City, Mo., Pioneer Trust Building. L. B. Jones is in charge of the Dallas office and John F. Wood of the Kansas City office.

George A. Muir, who has been connected with the Denver office of the Allis-Chalmers Manufacturing Company for the last five years, and for ten years previous to that with the machinery department of the Mine & Smelter Supply Company, Denver, has been elected to the office of president and manager of the Advance Machinery & Supply Company, Railroad Building, Denver, Col., which manufactures the Advance patented mechanical stoker and the Advance soot blower.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued Bulletin No. 214, on electric flashing beacons and automatic isolated traffic signals.

English Electric Company, Ltd., London, has issued an illustrated booklet descriptive of various types of electric locomotives manufactured by it. For the most part these machines are designed for operation by direct current at 1,500 volts. The control is of the all-electric type. The company's well-known camshaft controller is a feature of the locomotives.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, June 20, 1925 *Number* 25

You Cannot Get Something for Nothing

LIKE the impossible theory of perpetual motion, the idea of "getting something for nothing" still persists. The delusion is fondly cherished by some railway men that the company can have certain odd jobs done in its shops "without costing anything."

It cannot be done. No matter how simple the job, it will cost something. Maybe it is only the building of a filing cabinet or the refinishing of the office furniture. Nevertheless the time of the shopmen and the material used in the work have a definite money value. Of course these items can be charged off to some other account, and the odd job can thus be made to appear to have cost nothing. Such procedure, however, is merely a subterfuge and in the final analysis an actual expenditure has been made.

Very often small construction or repair jobs can be done more cheaply in the railway shop than they could be done outside. But that is a very different matter from having them done "for nothing." If careful study of costs shows that money can be saved by doing certain work in the shop, well and good. This is not always the case by any means, and it is a mistake to think that a home-made product is invariably a sound economy.

Keeping Car Lines Clear During Track Reconstruction

REBUILDING or extensive repair of city railway tracks ordinarily requires the transport of large quantities of material. The old rails, ties, ballast and paving must be removed and new materials must be hauled in to replace them. The time-honored custom has been to carry all this material in railway cars.

Unless special equipment is used which is designed for the purpose and can operate at an average speed as high as that of the passenger cars, there is always danger that movements of this sort may cause delay to the company's schedules on routes over which the work cars must pass. Heavy equipment, such as steam or electric shovels and concrete mixers can, however, be moved over the rails at night without the same chance of delay. Once on the job, it remains there until the work is completed.

The practice adopted by the Pittsburgh Railways in its recent track reconstruction work is to haul all loose materials by motor truck, as described in an article in this issue. By this means it is possible to keep the tracks clear, so that there is no possibility of interference with schedules. Furthermore, it may be practicable to select routes that are more direct than the street car routes can possibly be, as the latter are laid out solely for passenger service. In some cases supplies can be obtained from sources not on the rail lines, and excavated material can be disposed of in places likewise inaccessible.

As to the relative cost of work cars or motor trucks, much depends on the conditions surrounding each piece of work. Even in a single city there may be wide differences in the various districts. The use of motor trucks for haulage of track materials does have possibilities. It is well worth investigating in any particular case.

Putting Truck Repairs on a Manufacturing Basis

USUALLY the method of making truck repairs in electric railway shops is to withdraw cars from service after the morning peak, do the overhauling during the day and then return the cars to service for the evening rush period. In most cases the car bodies are jacked up or lifted from the trucks and remain on supports while the truck overhauling is being done. Where general overhauling of other equipment, painting of car bodies, etc., are carried out at the same time as truck overhauling, some railways place dummy trucks under the car bodies so that they can be shifted from one department to another, the original trucks after overhauling being again installed when the car is ready for service.

The methods used by the New York Rapid Transit Corporation, which are described elsewhere in this issue, differ quite radically from the usual procedure, in that trucks are changed from one car body to another and those released from cars in the shop for general overhauling are used as spares for emergency repairs and general truck overhauling. This method makes it possible for truck work to be carried on continuously without regard to the time that cars are released from service. Shop forces can be organized along the most effective lines and the work can be done in the most convenient manner. Cars with trucks requiring repairs are not withheld from service over extended periods, but can be brought into the shop, have their trucks removed and replaced by others, after which they can be returned to service without delay.

This method is made possible in Brooklyn principally because the 800 subway motor cars operated have the same type of truck. The arrangement of truck equipment divides these into four classes, but this does not affect the general overhauling plan that is used. Probably few railways have the opportunity to carry out truck repairs on such a large scale as is necessary in Brooklyn, but the method used there with such beneficial results emphasizes the value of standardization, or at least uniformity, of such equipment on an individual railway. Roads that have from 100 to 500 cars in operation with the same or similar types of trucks are fairly

This is the issue in June that is devoted essentially to maintenance subjects

numerous. Such railways could use the plan of continuous truck overhauling to advantage.

Truck maintenance is one of the big problems of car equipment departments. The truck frame supports the car body with its load, transmits the starting torque of the motors, and receives the braking forces. Its members are thus subjected to varying stresses large in amount, so that wear is rapid and repairs are needed more frequently than with other parts of car equipment. Any method that will permit of more thorough truck repairs and at the same time reduce their cost should prove of particular benefit.

Entering the Coffin Competition Aids the Individual Company and the Industry

BRIEFS submitted by electric railways in competition for the 1925 Coffin Prize must be ready by Aug. 1, a half month earlier than last year. There is still ample time, but none too much, for preparation. The upward turn in the affairs of many companies, as well as their recent splendid accomplishments under differing conditions, should act as an incentive to their interest in this year's competition.

Aside from the laudable desire to capture the honor of this award, with the accompanying prestige, there are secondary incentives of almost equal potency. The inevitable results of the intimate study of its own equipment and methods which a company must make in preparing its presentation are in themselves worth the effort. As item after item is compared with standard practice to determine its fitness for inclusion, the railway management becomes more and more conversant with its local problems. There is a further appeal in this competition through the desire to contribute to the standing of the industry in the opinion of the public. The award is given wide publicity; it is a matter of general news interest. By entering the competition and having their accomplishments advertised to the public progressive railways add materially to the prestige of the industry.

Educational Work Must Be Continued After Graduation

JUNE is the month of school and college commencements. They are properly so called because they mark the threshold of a new phase of life for each graduate. He has done well in finishing the course of study in which he was engaged. He has learned certain principles. But if he enters industry he will find that from the producing standpoint the most important things are still to be learned. In fact, learning them is a continuous process; they are never completely learned.

Many of the 1925 graduates will choose electric railway work for their careers. What is the electric railway going to do to help them learn the transportation business? What is it doing for their predecessors? The answer depends upon the characteristics of the property with which they cast their lots. An increasing number of railways are coming to realize the desirability of furnishing educational opportunities to their employees. It is a paying proposition.

While a spirit of paternalism on the part of an employer is to be avoided, it is possible to conduct educational and other activities without it, if they are frankly intended to render employees more efficient. This applies even to cultural studies that have no direct bearing on the work in hand. It is truer today, perhaps, than ever before that "man shall not live by bread alone." Any study, whether vocational or cultural, will produce a more intelligent employee. Is yours one of the properties where ambitious employees are encouraged and assisted to become more effective through study?

Boston's Case for Arbitration of Arbitration Procedure

EVERY ONE is interested in the amount he pays for fare, but the public of Greater Boston has a peculiarly close interest in the matter. If need be, it makes up the difference between the income of the Boston Elevated Railway and its outgo by any assessment which it stands itself. The company wants to pay wages that reflect full recognition for the work which the men do, but it does not want to pay more than that.

The situation is peculiar. Each time the company has been able to look ahead toward operating at a profit a wage award has come along and offset much of the good work done by the management. It reflects in no way on the personnel of arbitration boards of the past to say that arbitration has been a sad process—sad for the company and sad for the public.

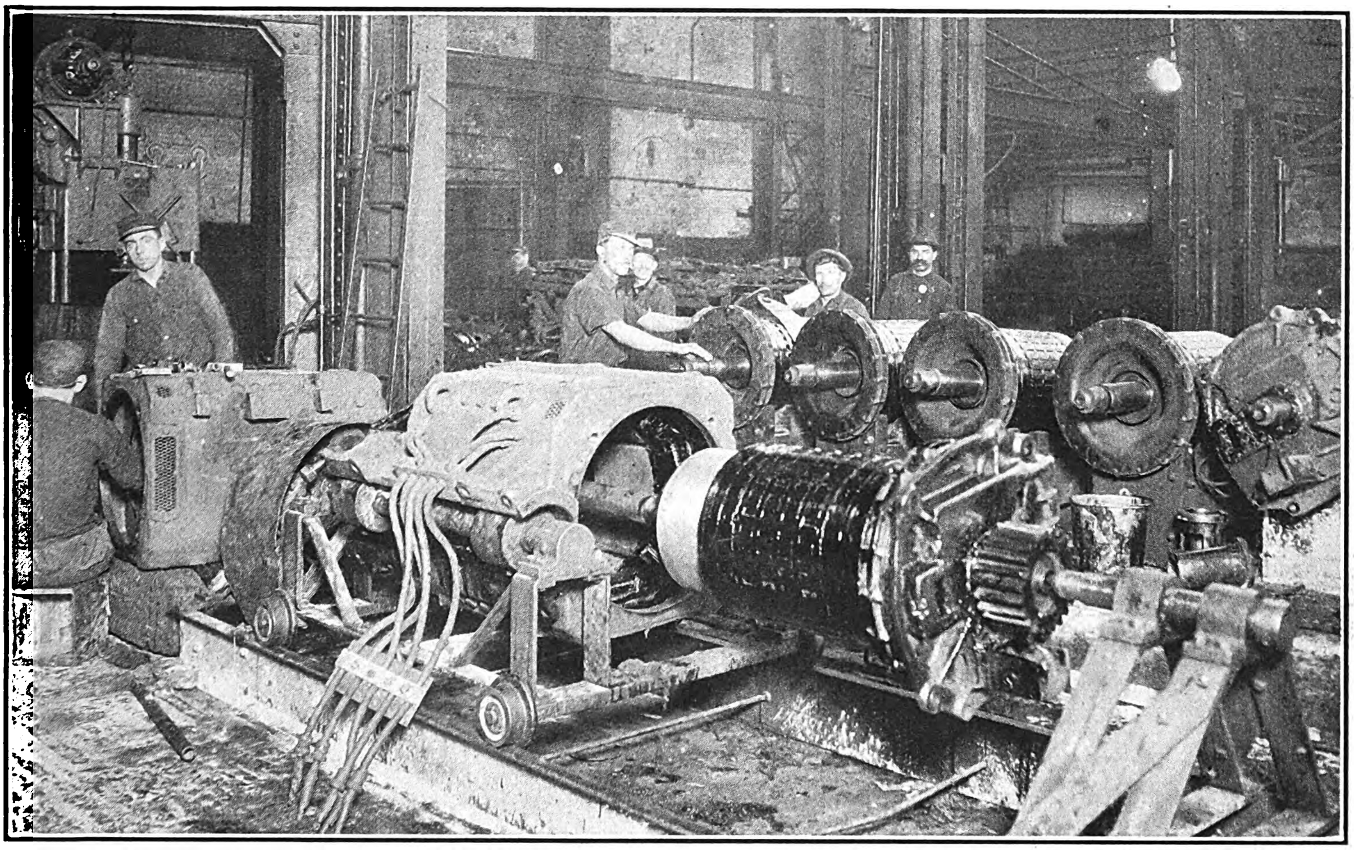
Only a year ago the railway was required to increase the wages of its men 2½ cents an hour. The men had asked 20 cents more. Back wages to the amount of $175,000 had to be made up. The scale then decided upon was 72½ cents maximum for two-man car operators and 80½ cents for one-man. As a result it was necessary on the so-called community lines to put the fares up from 5 cents to 6 cents. The year before the men got an increase of 15 per cent.

The company now has no way to turn. It has about exhausted the limits to which operating economies can be carried. Due to his excellent work, General Manager Dana expects to come out even for the fiscal year ending this month. Excess of receipts over cost of service for four months ended April 30 was $730,425, against $237,188 in the same period of 1924. This is a remarkable showing. It means little to the public, however, if the men are to be allowed to undo the good work by carrying off all the savings. This they are attempting to do again.

The method of arbitration used in the past is one that the management inherited. Under conditions of private operation it was the generally accepted form, but with the interest of the community in the outcome enhanced materially the trustees say a form of arbitration more nearly in keeping with the present requirements should be perfected. All the company seeks is a representative on the board who may be expected to reflect the attitude of the public more determinedly. It has suggested that the plan of each side appointing an arbitrator be continued, but that instead of these two selecting the third member the Governor be designated to name the third man. As the trustees see it there is explicit authority to submit this very question to arbitration. The employees, on the other hand, contend that the method followed in previous cases is unalterable. Meanwhile each side is marshaling the facts regarded by it as essential to the success of its case in the present impending arbitration. The great difference in point of view appears to be that the trustees are conscious of the need to guard carefully other people's money, so called, while the men appear to be interested chiefly in converting this commodity to their own selfish end.

Truck Overhauling Made a Continuous Performance

Trucks Removed from Cars Are Replaced with Repaired Trucks Immediately so that Cars Are Not Withheld from Service for Truck Repairs—Spare Trucks for This Work Are Obtained from Cars in for Overhauling—Additional Facilities Provided for Truck Repair Work



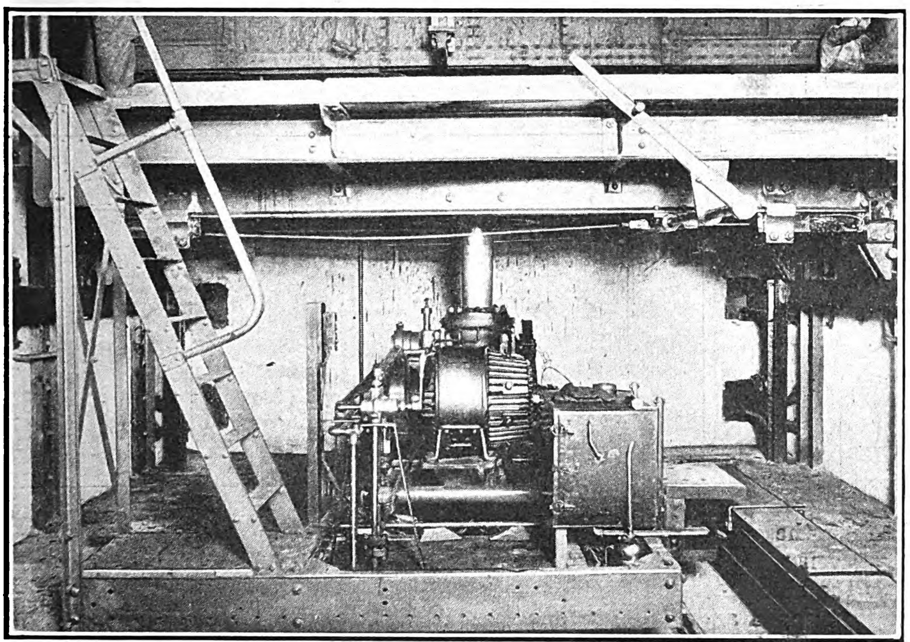
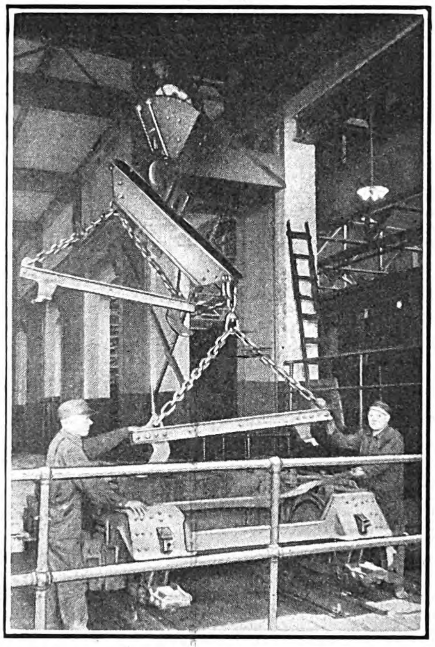
Installing an Armature from a Box Frame Motor in the Motor-Overhauling Section of the 36th Street Repair and Inspection Shop, Brooklyn

EXPANSION of shop overhauling facilities of the New York Rapid Transit Corporation, which operates the elevated and subway lines of the Brooklyn-Manhattan Transit Corporation, was made necessary by the large increase in the number of cars operated. For truck repair work an addition has been built at the 36th Street repair and inspection shop in Brooklyn and is now in operation. The previous truck overhauling facilities at the shop have also been remodeled and combined so that a floor space of approximately 165 ft. x 18 ft. is available for truck overhauling of subway cars. The addition is of brick on a reinforced-concrete foundation and with concrete floors. At one side of the building a floor space of approximately 100 ft. x 18 ft. is used for washroom, toilet room, locker room and switchboard room. Approximately half of this is new construction.

The height of the new overhauling section is 30 ft. This gives ample headroom for traveling cranes, two of which serve the new overhauling section and travel the full length of the building. The remodeled overhauling section of the shop is also served by two overhead traveling cranes, but these run side by side instead of spanning the entire width as in the newly constructed portion. All cranes are of 15-ton capacity and were furnished by Alfred Box & Company, Inc., Philadelphia, Pa.

There are two tracks in the new truck overhauling section. One runs approximately one-half the length of the extension, starting at a drop pit in the front end of the building used for the removal of trucks from cars. This track is used for trucks previous to and after they are overhauled and for wheels required for replacement. A second track 100 ft. long extending into the front end of the building is used for supply cars. By this means they can be unloaded or loaded with wheels directly by the overhead traveling cranes.

For removing trucks from car bodies there is a Watson-Stillman 50-ton motor-driven pit jack operating in conjunction with a special crane furnished by the Detroit Hoist & Machine Company. The new shop is adjacent to the old inspection shop. This has made it possible to use the track nearest the new overhauling section for the removal of trucks and they are trans-

At Left—Pit Jack with Table in Raised Position. At Right—Picking Up a Truck with Overhead Traveling Crane to Place It in Position for Overhauling

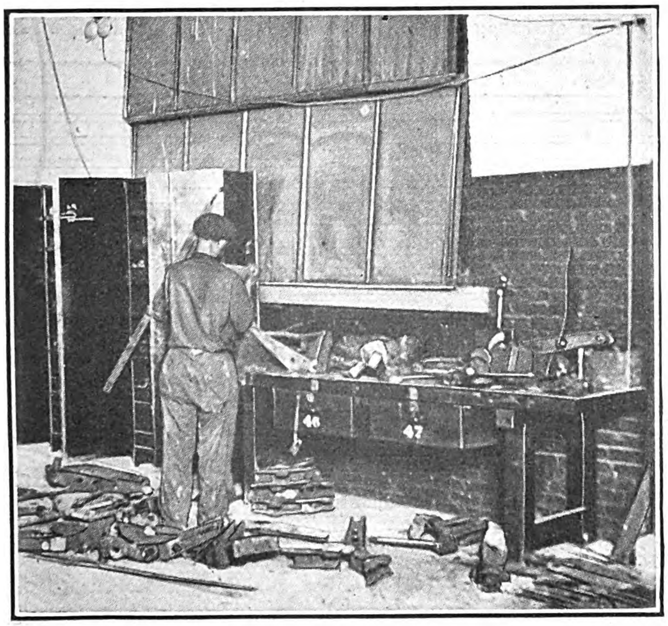
ported from this point to the first parallel track in the new shop by means of the pit jack.

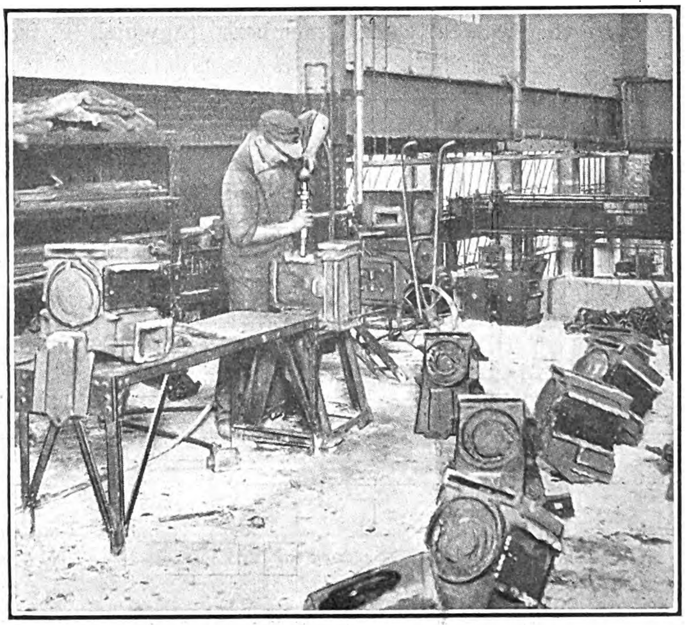
The car bodies are held in a suspended position while the trucks are removed by a special hand-geared traveling crane. This crane has a span of 29 ft. extending over the truck removal track and is equipped with special trolleys and appliances for convenient operation. The crane proper is of typical single I-beam construction, having a 24-in. beam for the main girder, with reinforced side girder. It is arranged with the customary hand chain for travel. Two special trolleys are mounted on this I-beam and two long suspended arms or leg members are fastened to these. Two pneumatically operated cylinders permit the special trolleys to move a definite distance. The suspension members are arranged with hooks at their bottoms which can be inserted underneath the side sills of the car bodies.

The mechanism for operating the trolleys consists of a 6-in. double-acting cylinder, equipped with necessary valves and fittings. Oil is used on one side of the plunger to restrict and vary its speed of travel. Air is admitted to the cylinder through a valve mounted in the center of the crane. The valve is controlled from the floor by drop cords. The control of the oil is likewise governed by an adjustable valve operated from the floor.

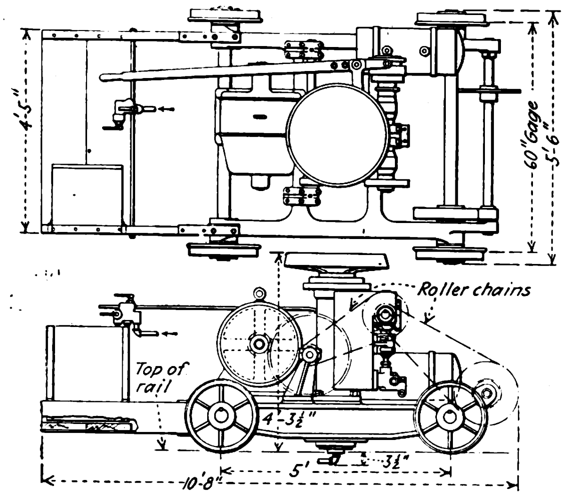
WORK OF OVERHAULING INFLUENCED BY TRAIN MAKE-UP

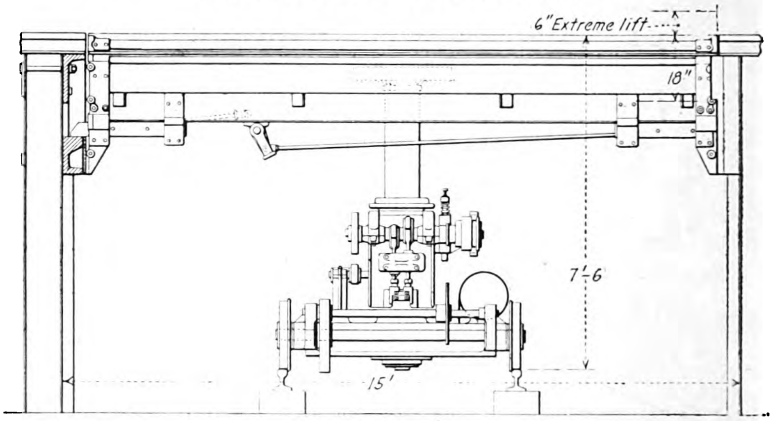
Most of the subway cars of the New York Rapid Transit Corporation are operated in groups of three. These are handled as units, being kept together and shopped at the same time. Whenever it is necessary to remove a particular truck the three cars are brought in on what is termed track No. 10. This is the one fitted with the special traveling crane. For convenience of the motorman in stopping the train accurately, so that a particular truck will come in a desired location, large numbers, 1, 2, 3, etc., are placed on sheet steel plates alongside the rail. Thus the motorman can adjust his train accurately for truck removal. With the truck in





At Left—Brake Rigging Is Dismantled, Repaired and Assembled at a Bench. At Right—Riveting Gib Plates in Position on Truck Journal Boxes





Details of Pit Construction and of Motor-Driven Pit Jack. The Entire Jack Runs on a Track Located Transversely to the Running Rails, so that the Trucks Are Readily Taken Out

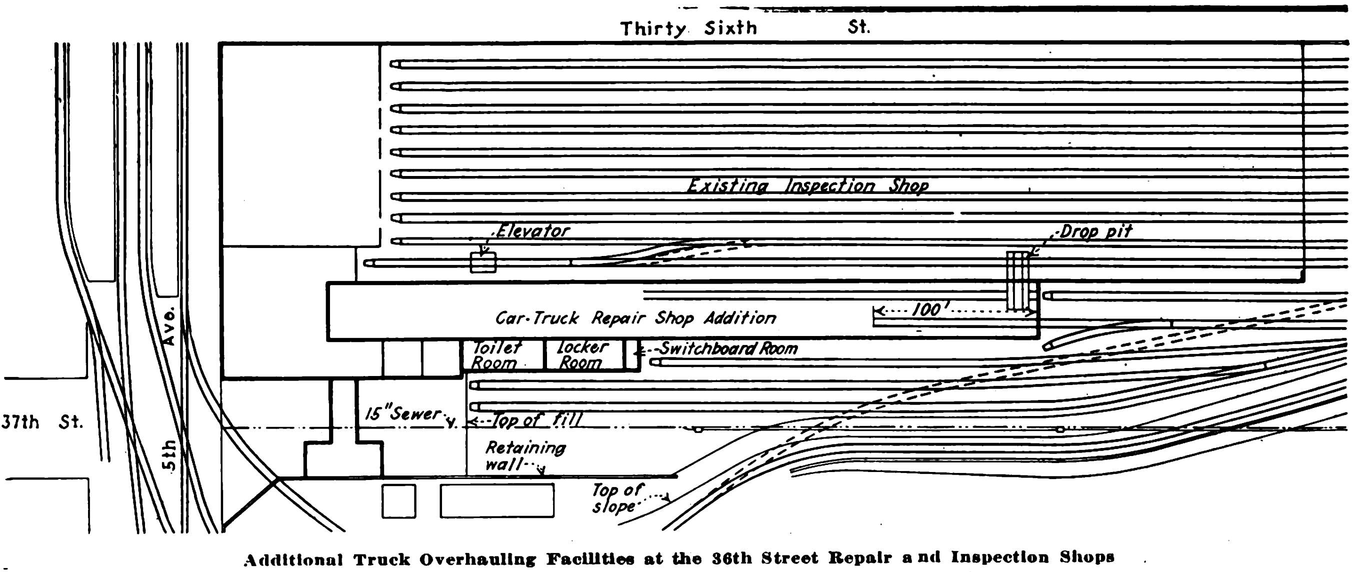
position, the car is lifted slightly by raising the entire end of the body with the 50-ton motor-driven pit jack so that the hooks may be inserted under the side sills. When the hooks are in place the truck is dropped and transported to the adjacent track in the new overhauling section by the pit jack. The pit in which this operates is 15 ft. wide by about 8 ft. deep. The pit jack moves on a track of two standard T-rails at 5-ft. gage. The distance from the tops of these rails to the tops of the running rails on which the cars operate is 7 ft. 6 in.

Pit Jack Is of Novel Construction

A pit jack of new type has been designed to facilitate the removal of the car trucks. Raising and lowering are by means of a ram, provided with a positive stop to prevent pumping out. The rams are of machinery steel and are made with ample bearings in the cylinders and with sufficient diameter to carry the maximum load rigidly. The top of the jack is fitted with a table casting, onto which the truck table fits. The truck table is designed to act as a bridge over the pit and is held in place at the top of the pit by four positive locking bolts, one at each corner of the table. The four bolts are operated in unison from a single lever.

The table itself is a solid unit provided with a steel casting into which the head of the jack fits. This casting is reinforced to transmit the full pressure of the jack to the two table side members, to which it is rigidly secured. These side members are 18-in. I-beams. The rails on which the car trucks operate are attached to the top of the table. Four cast steel guides, one at each corner of the table, keep it in alignment while it is being raised or lowered. Four steel castings, one at each corner of the table, fit into these guides. Their machined surfaces take the side and end play of the table. The top portions of the guides are designed to receive the table supports and to carry the table with its live load when acting as a bridge. These guides are supported by the concrete walls of the pit through imbedded steel members. Self-centering wheel stops hold the truck wheels in position while the table is being lowered or raised. This stop mechanism can be moved toward or away from the rails by a lever.

A 7½-hp. Westinghouse motor operates the hydraulic pump and also drives the pit jack transversely. While the jack is being moved transversely the pump is by-passed. The hydraulic pump is of the two-plunger type, with plungers packed by easily removable adjustable glands. All gears and chain drives are protected with sheet metal covers. A tank is provided for holding the light machine oil which is used in this jack. All vertical and transverse motions of the jack are controlled by a valve mounted upon the jack platform and the operator rides with the jack. The valve arrangement is such that the shop air supply may be by-passed for ease in starting and also to allow the pump to remain



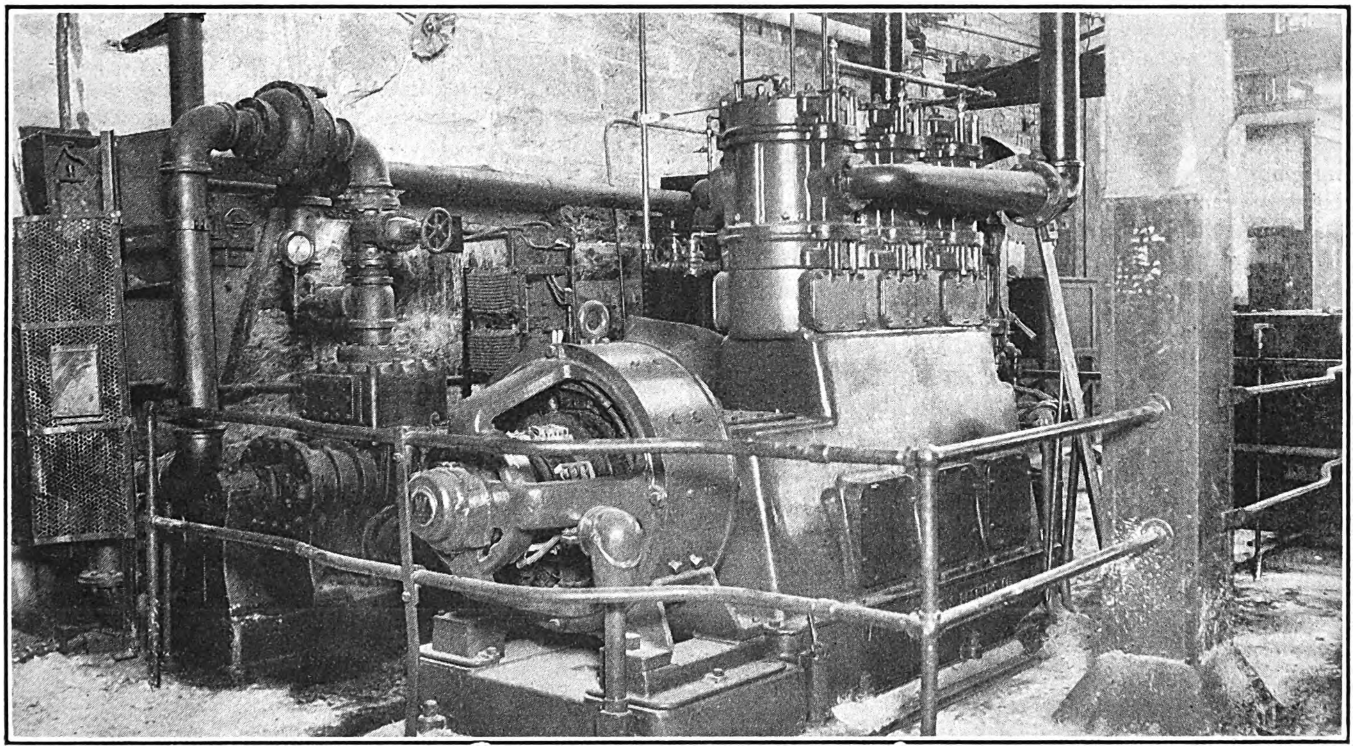
Additional Truck Overhauling Facilities at the 36th Street Repair and Inspection Shops of the New York Rapid Transit Corporation, Brooklyn, N. Y.

idle while the jack is traversing. A safety valve eliminates the possibility of an overload and also prevents over-pressure in air lines.

A connection is also made to the shop air line and air is admitted to the top of the reservoir tank for forcing the oil through the valves into the hydraulic cylinder. Out of the total lift of the jack, which is 24 in., 18 in. is from the low position to the top of the rail. A further 6-in. movement above this point permits compression of the car springs and lifts the truck and car body for placing in position the suspension members of the overhead crane. The electrical connection from the pit to the crane is made through a third rail with contact shoe. The speed across the pit is about 40 ft. per minute and the lifting speed is 4 ft. per minute. Accompanying illustrations show the construction of this equipment.

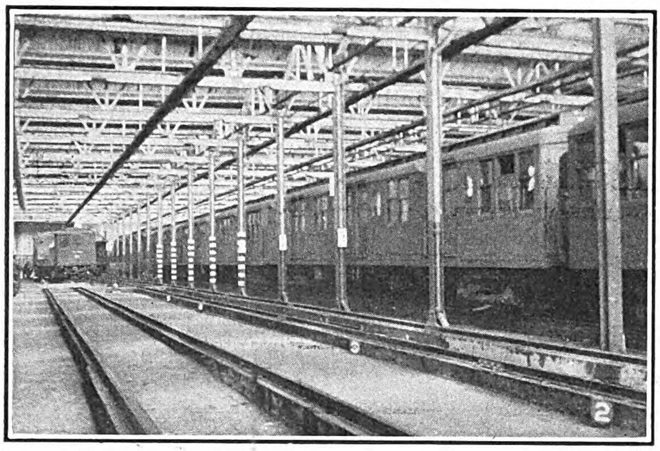
The new section of the shop is used only for overhauling trucks of subway cars, and the overhauling work consists of two classes. First, there is what is termed general overhauling, which takes place every eighteen months. At this time the trucks are taken apart and all equipment is removed. All parts are investigated carefully and everything is renewed or repaired that could not stay out safely for a further period of two years. Any weaknesses which have been found are taken care of by reinforcing. The second class of truck repairs is for crippled cars, where it is necessary to hold these out of service for truck work.

From one of the accompanying illustrations it will be seen that for overhauling the truck is placed on a special type of stand which elevates the truck approximately 12 in. from the floor level. The top members of the stands on which the truck wheels rest are made of standard T-rail. Details of construction of these truck stands were described in the ELECTRIC RAILWAY JOURNAL for May 19, 1923, page 853. The new section of the 36th Street shop is provided with twenty overhauling stands, of which fourteen are used for emergency repairs, while six crews work on general overhauling. General overhauling of trucks is also carried out at the 39th Street shop, where all the general overhauling of the car bodies is also done. At present the six trucks for a three-car unit are overhauled at 36th Street each week. It is the practice to do this work a week preceding the date that the cars are scheduled to go into 39th Street for their general overhauling. Nine men do this general overhauling work. One pulls down and assembles the truck on a piece-work basis. Two men fit up and assemble brake rigging at the bench. With this method shoe heads are assembled and attached to hangers, so that they can be hung into place on the truck frame with the least possible additional labor. Two other men form a riveting crew and one man with the acetylene torch burns off rivets and nuts which have become rusted and does additional welding work. One man, a machinist, drills the pedestals for liners and drills other holes necessary for reinforcing parts. One man on journal boxes removes old pedestal liners and puts on new ones. Another man cleans out and packs journal boxes. He serves as an additional helper for other work.


A Large Shop Air Compressor Furnishes Compressed Air for Various Pneumatic Tools and for Cleaning During Overhauling

Four other men do motor overhauling, both for subway and elevated cars, in a section devoted particularly to this work. Truck repair crews for emergency repairing consist of two men. Motor repairs are taken care of separately.

With this method of overhauling, cars are not withheld from service while the repairs are being made, but the car is brought over the drop pit, the truck requiring repairs is removed and another truck is placed underneath the car immediately, so that it can be returned to service. Thus between general overhaulings no attempt is made to keep the trucks with the car bodies under which they left the shop at general overhauling. When the cars and trucks are due again for



Numbers at Base of Rail Assist Motorman in Locating the Trucks Accurately Over Drop Pit

their general overhauling, however, the trucks are sent into the shop under the same car bodies that they left with.

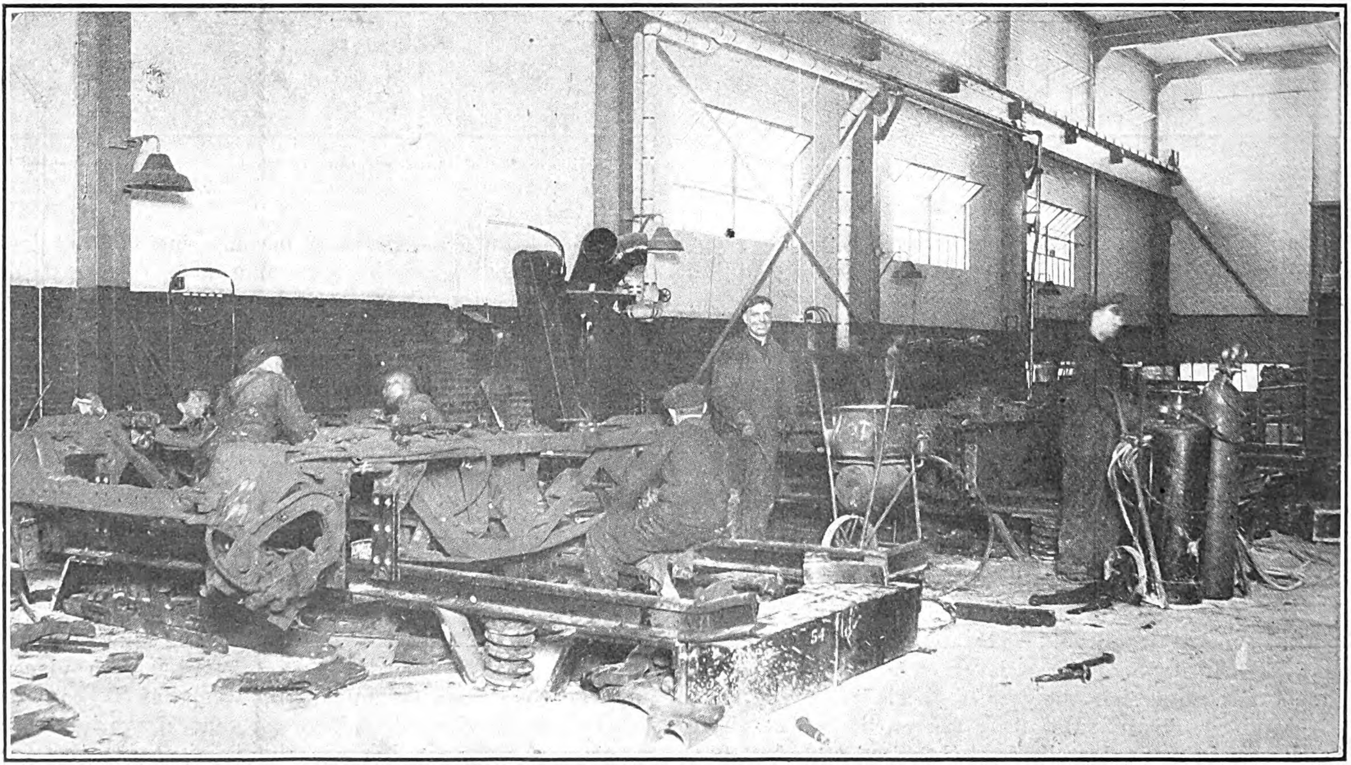
In considering this method of carrying out truck overhauling, one at first might consider that a large number of spare trucks would be necessary. On the contrary, as the plan is carried out by the New York Rapid Transit Corporation no additional spare trucks have been found necessary. The reason for this is that trucks from cars which are in for general overhauling and re-enameling are used to carry out all truck overhauling work. As soon as a train is placed in the 39th Street shop for general overhauling car bodies are raised and placed on supports. This arrangement releases an ample number of trucks to take care of both emergency truck repairs and general overhauling.

The trucks for the subway motor cars are all of one type, but are of four different kinds, due to the arrangement of equipment. Thus, under the same car, trucks for No. 1 end will differ from those at No. 2 end. The leads from the shoe beams are brought to a connecting cable at a different side of No. 1 truck from that necessary with the No. 2 truck and the latter is also fitted with the empty and load braking device. Another factor also affects the interchangeability of trucks. This is the use of emergency trips on cars of this railway. It is the practice to install the electric trip mechanism only on the end trucks of three-car units. There will thus be trucks with and without the electric trip mechanism. This, together with the difference in trucks for No. 1 and No. 2 ends of cars, makes the four kinds of motor trucks necessary. In addition, the company also operates trailers in some train make-ups and the trailer trucks are different from motor trucks. Altogether, there are five kinds of trucks to be overhauled for subway cars.

ACCURATE RECORDS SAVE TIME

A carefully worked out record system is used to make certain that the correct kind of truck is always available for replacement whenever a car is ordered in, either for emergency repairs or for general overhauling. For convenience in the record work and also in the truck overhauling work a chart has been made up showing the arrangement of cars in the different units. This is framed and hung in a convenient place in the shop office. By referring to portions reproduced in one of the accompanying tables it will be seen that the type B units consist of three motor cars; BX units are made up with two motor cars and a trailer between; BT units consist of two motor cars, and type A units are single motor cars. With this arrangement any number of cars can be made up into a train without disturbing the arrangement of units.

An accompanying diagram also shows the arrangement of cars in a B unit. Reading from left to right in this diagram, it will be seen that the trucks are No. 2 with trips, No. 1 without trips, No. 1 without trips,



A Truck Undergoing General Overhauling. An Acetylene Outfit Is Used for Cutting Off Rivets and Bolts and a Rivet Torch Provides for Heating Fresh Rivets

ARRANGEMENT OF UNITS—SUBWAY CARS

Type B

2000-01-02	2162-63-64	2324-25-26	2588-89-90
2003-04-05	2165-66-67	2327-28-29	2591-92-93
2006-07-08	2168-69-70	2330-31-32	2594-95-96
2009-10-11	2171-72-73	2333-34-35	2597-98-99
2012-13-14	2174-75-76	2336-37-38	2750-51-52
2015-16-17	2177-78-79	2339-40-41	2753-54-55

Type BT

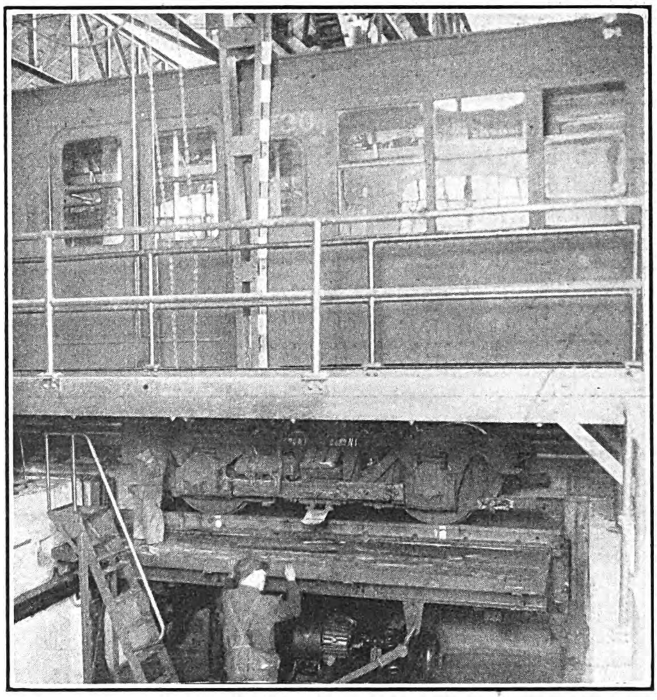
2816-17	2492-93	2496-97
2490-91	2494-95	2498-99

Type BX

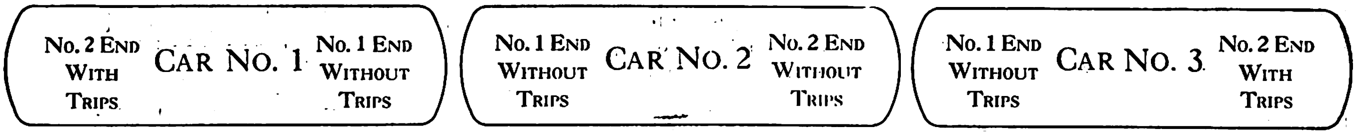
2400-4000-2401	2438-4019-2439	2476-4038-2477
2402-4001-2403	2440-4020-2441	2478-4039-2479
2404-4002-2405	2442-4021-2443	2480-4040-2481
2406-4003-2407	2444-4022-2445	2482-4041-2483

Type A

2399	2624	2650	2676	2702	2728
2500	2625	2651	2677	2703	2729
2600	2626	2652	2678	2704	2730
2601	2627	2653	2679	2705	2731
2602	2628	2654	2680	2706	2732
2603	2629	2655	2681	2707	2733



Lowering a Truck by Means of the Pit Jack



Arrangement of Units in Three-Car Trains. Only Three Types of Trucks Are Needed

No. 2 without trips, No. 1 without trips and No. 2 with trips. Thus, as No. 2 trucks are the only ones provided with trip cocks, such a three-car unit has but three kinds of trucks.

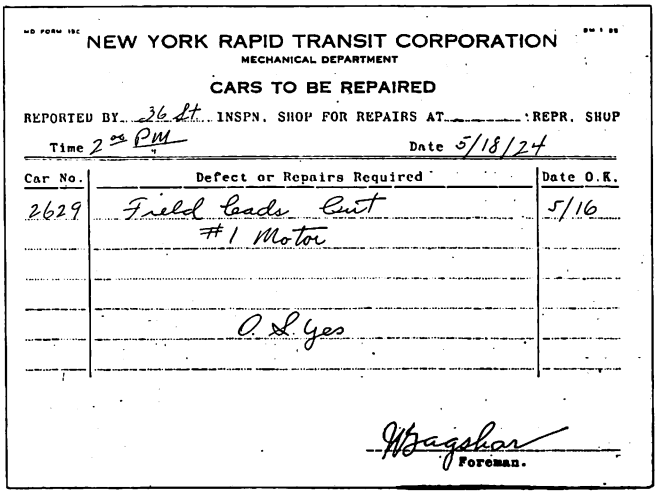
A crew which does general overhauling averages one truck per day. Both trucks under the same car will thus be overhauled in an interval of two days, and the entire three-car unit will be completed in a week. In order to take care of this work without withholding the trains from service, three spare trucks are used, and on Monday morning a No. 2 truck with trips, a No. 2 truck without trips and a No. 1 truck without trips are ready for replacing like trucks which are to be overhauled.

Early Monday morning the three-car unit is brought into the shop and the No. 2 truck with trips and No. 1 truck without trips are removed and replaced on car No. 1. These trucks are overhauled and ready for use again Wednesday morning when the unit is again brought in. Then the No. 1 truck without trips and No. 2 truck without trips from the center car No. 2 are removed and replaced. On Friday morning the third car of the unit has its trucks removed, which consist of No. 1 truck without trips and No. 2 truck with trips. These are then overhauled, so that the same combination of trucks is again ready the following Monday for use in overhauling a new unit.

Two card record systems are used to keep track of the trucks and to give immediate information as to the location of any particular truck. One of these is arranged by car numbers and the other by truck numbers. The car cards show the trucks in and out, together with dates. The truck cards give the car numbers in which the trucks are installed or removed, together with date. The drop table crew keeps in a book a record of trucks as they are removed and installed. There are two sets of books, so that one set may be worked on in the office, while the other is used by the transfer table crew. These books are arranged with columns to show the number of the truck, the car from which it is removed and time of removal, the number of the truck which is replaced and the time that it goes under the car.

Disconnecting of leads, brake rigging, etc., preparatory to the removal of the truck is done by crews in the inspection shop on the track adjacent to that used for dropping out the trucks. When a train is placed in position for disconnecting preparatory to removal of the truck a whistle is blown as a signal and one of the regular inspection crews then does this work.

With the arrangement and schedule now being carried out, an average of twelve trucks per day are taken care of for emergency repairs. The average time from the placement of a car over the drop pit until a new truck is in position so that the train can be taken away is twelve minutes. The transfer table crews gage and adjust side bearings before the car goes



MD FORM 15C

NEW YORK RAPID TRANSIT CORPORATION
MECHANICAL DEPARTMENT

CARS TO BE REPAIRED

REPORTED BY 36 St INSPN. SHOP FOR REPAIRS AT ____ REPR. SHOP

Time 2 00 PM Date 5/18/24

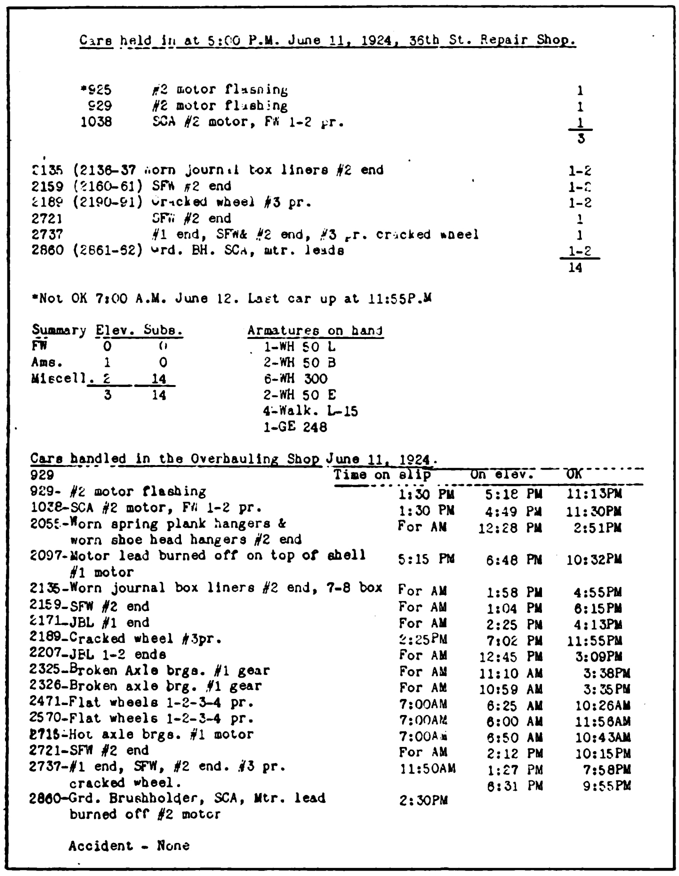
Car No.	Defect or Repairs Required	Date O.K.
2629	Field Leads Cut	5/16
	#1 Motor	
	O. S. Yes	

W Bagshaw
Foreman.

Form MD-15-C Is Used for Reporting Trucks Which Require Repairs to the inspection pit for reconnecting leads and brake rigging. The shop crews work from 7 a.m. to 4:30 p.m. each day and the transfer table crew from 8 a.m. to 5:30 p.m.

The ordering in of cars and the time at which they are to be placed for overhauling is under the direct supervision of the general repair shop foreman. Crippled cars are turned over by the inspection shop forces by filling out form MD 15 C, which shows cars to be repaired. An accompanying illustration shows one of these forms. In making out this form the foreman marked it OS yes, or OS no, showing that the car is out of service and cannot be operated until repairs are made, or that it may continue to remain in service until the repair shop is ready to order it in for repairs.

Two types of reports are made out from the form MD 15 C. One of these consists of a report of cars held in at 5 p.m. and gives the car number and the reason for holding in. At the bottom of this same report is a record of cars handled in the overhauling shop during that day. This report gives the car number, the defects for which repairs were made, the time that the slip was turned in, the time that the car was placed over the drop pit and the time that the car was approved and ready for service. The second form is one which is delivered to the division superintendent each morning for ordering in the cars that are to be repaired during the day. It will be appreciated that in making out these reports a careful check must be made of the trucks which are available for replacement and also of the time that trucks will be finished and can be used for replacing the same kind of truck under other cars. Otherwise there might be a delay in waiting for one of the proper trucks to be finished.



Cars held in at 5:00 P.M. June 11, 1924, 36th St. Repair Shop.

*925	#2 motor flashing	1
929	#2 motor flashing	1
1038	SCA #2 motor, FW 1-2 pr.	1
		3

2135	(2136-37	worn journal box liners #2 end	1-2
2159	(2160-61)	SFW #2 end	1-2
2189	(2190-91)	cracked wheel #3 pr.	1-2
2721		SFW #2 end	1
2737		#1 end, SFW& #2 end, #3 pr. cracked wheel	1
2860	(2861-62)	Grd. BH. SCA, mtr. leads	1-2
			14

*Not OK 7:00 A.M. June 12. Last car up at 11:55P.M

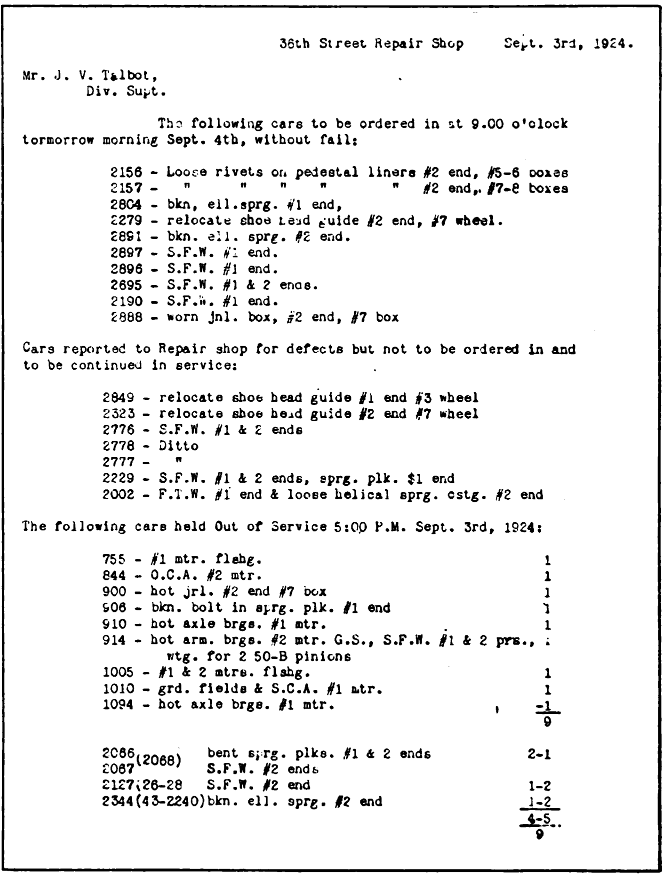
Summary	Elev.	Subs.
FW	0	0
Ams.	1	0
Miscell.	2	14
	3	14

Armatures on hand
1-WH 50 L
2-WH 50 B
6-WH 300
2-WH 50 E
4-Walk. L-15
1-GE 248

Cars handled in the Overhauling Shop June 11, 1924.

929	Time on slip	On elev.	OK
929- #2 motor flashing	1:30 PM	5:18 PM	11:13PM
1038-SCA #2 motor, FW 1-2 pr.	1:30 PM	4:49 PM	11:30PM
2055-Worn spring plank hangers & worn shoe head hangers #2 end	For AM	12:28 PM	2:51PM
2097-Motor lead burned off on top of shell #1 motor	5:15 PM	6:48 PM	10:32PM
2135-Worn journal box liners #2 end, 7-8 box	For AM	1:58 PM	4:55PM
2159-SFW #2 end	For AM	1:04 PM	6:15PM
2171-JBL #1 end	For AM	2:25 PM	4:13PM
2189-Cracked wheel #3pr.	2:25PM	7:02 PM	11:55PM
2207-JBL 1-2 ends	For AM	12:45 PM	3:09PM
2325-Broken Axle brgs. #1 gear	For AM	11:10 AM	3:38PM
2326-Broken axle brg. #1 gear	For AM	10:59 AM	3:35PM
2471-Flat wheels 1-2-3-4 pr.	7:00AM	6:25 AM	10:26AM
2570-Flat wheels 1-2-3-4 pr.	7:00AM	6:00 AM	11:56AM
2715-Hot axle brgs. #1 motor	7:00AM	6:50 AM	10:43AM
2721-SFW #2 end	For AM	2:12 PM	10:15PM
2737-#1 end, SFW, #2 end. #3 pr.	11:50AM	1:27 PM	7:58PM
cracked wheel.		6:31 PM	9:55PM
2860-Grd. Brushholder, SCA, Mtr. lead burned off #2 motor	2:30PM		

Accident - None



36th Street Repair Shop Sept. 3rd, 1924.

Mr. J. V. Talbot,
Div. Supt.

The following cars to be ordered in at 9.00 o'clock tormorrow morning Sept. 4th, without fail:

2156 - Loose rivets on pedestal liners #2 end, #5-6 boxes
2157 - " " " " " #2 end, #7-8 boxes
2804 - bkn, ell.sprg. #1 end,
2279 - relocate shoe head guide #2 end, #7 wheel.
2891 - bkn. ell. sprg. #2 end.
2897 - S.F.W. #1 end.
2896 - S.F.W. #1 end.
2695 - S.F.W. #1 & 2 ends.
2190 - S.F.W. #1 end.
2888 - worn jnl. box, #2 end, #7 box

Cars reported to Repair shop for defects but not to be ordered in and to be continued in service:

2849 - relocate shoe head guide #1 end #3 wheel
2323 - relocate shoe head guide #2 end #7 wheel
2776 - S.F.W. #1 & 2 ends
2778 - Ditto
2777 - "
2229 - S.F.W. #1 & 2 ends, sprg. plk. $1 end
2002 - F.T.W. #1 end & loose helical sprg. cstg. #2 end

The following cars held Out of Service 5:00 P.M. Sept. 3rd, 1924:

755 - #1 mtr. flshg.	1
844 - O.C.A. #2 mtr.	1
900 - hot jrl. #2 end #7 box	1
906 - bkn. bolt in sprg. plk. #1 end	1
910 - hot axle brgs. #1 mtr.	1
914 - hot arm. brgs. #2 mtr. G.S., S.F.W. #1 & 2 prs., wtg. for 2 50-B pinions	1
1005 - #1 & 2 mtrs. flshg.	1
1010 - grd. fields & S.C.A. #1 mtr.	1
1094 - hot axle brgs. #1 mtr.	-1
	9

2066 2067	(2068)	bent sprg. plks. #1 & 2 ends S.F.W. #2 ends	2-1
2127	(26-28	S.F.W. #2 end	1-2
2344	(43-2240)	bkn. ell. sprg. #2 end	1-2
			4-5
			9

At Left—Report of Cars Held in at 5 P.M. and Cars Handled in the Overhauling Shop. At Right—Form Used for Ordering Cars in for Truck Overhauling

Fire and Watchman's Signal System in Torrance Shops

PROMPT assistance can be given to the night watchman in case of emergency by means of a complete automatic fire alarm and watchman signal system recently installed in the Torrance shops of the Pacific Electric Railway, Los Angeles, Cal. It also provides better fire protection.

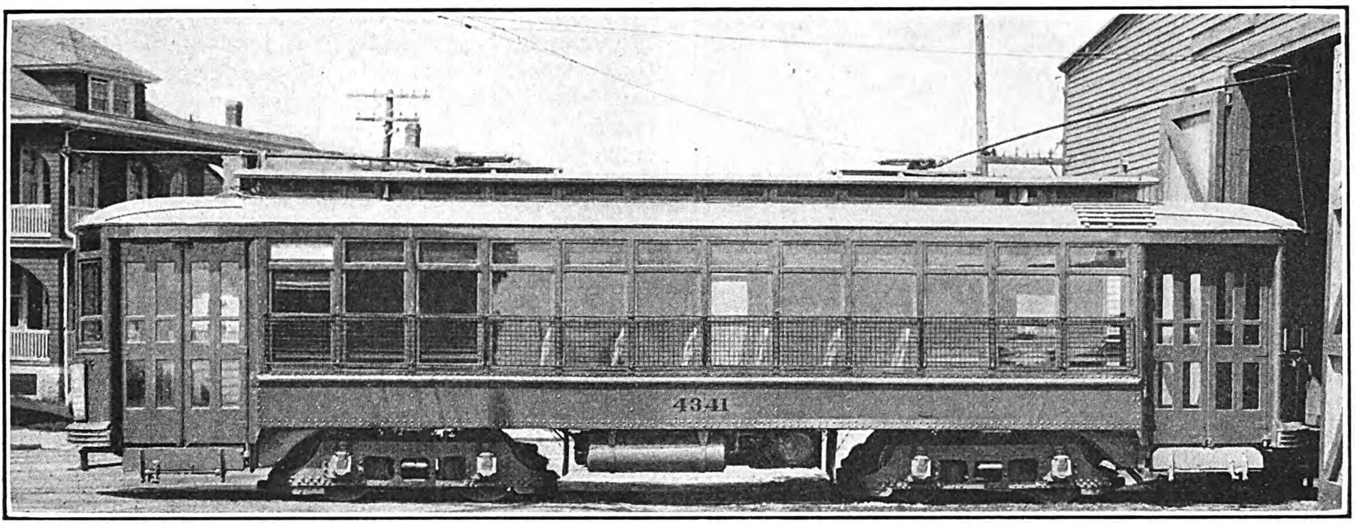
This system consists of a relay panel switchboard, fire and watch recording units, master clock, call bells, motor-generator set, batteries, etc., in the power house and 42 fire and watchman boxes located throughout the yards and buildings. In connection with the fire alarm equipment, a new motor-driven high-pressure water pump is being installed in the power house.

This signal system is similar to the ones used in many cities where the fire boxes are located on street corners and in case of fire are operated by breaking a glass window and pulling down a lever to cause the sounding of an alarm in the fire station, together with the display of a call number to give the location of the box pulled.

At Torrance the alarm signals are received and recorded in the power house by a device that punches holes in a paper tape and at the same time blows the drill whistle and sounds the three alarm gongs.

Each box has a code number of two or three figures which are represented by short blasts on the whistle and single strokes on the alarm gongs.

Since it would hardly be possible to remember the number and location of 40 alarm boxes, unless an easily remembered numbering plan is used, the yard is divided into four fire zones by north and south lines.



Type of 44-Ft. Semi-Convertible Car Which Is Repainted at a Cost of $69 by the Eastern Massachusetts Street Railway

Modernizing Car Painting Methods*

Spray Painting, Together with a One-Coat System, Simplified Color Scheme, Standardized Operations and a Premium System of Wage Payment, Produced a Saving of $42,000 per Year

By H. T. Hurlock

Engineer of Equipment Eastern Massachusetts Street Railway,
Chelsea, Mass.

PARTICULAR attention has been paid during the past four years to car painting by the Eastern Massachusetts Street Railway. The officials of this road believe that they cannot afford to operate ill-appearing cars in competition with private automobiles and buses and that electric car service cannot be advertised in any cheaper manner than by attractive rolling stock. Of the 734 revenue passenger cars owned and operated by the company, about 600, or approximately 82 per cent, will be put through the shops this year for painting. The schedule for painting cars is arranged on a mileage basis and cars are brought in for repainting every 35,000 miles. With the present service of the Eastern Massachusetts Street Railway, this brings regular cars in for painting every ten to twelve months. Cars in irregular service come in for painting approximately every eighteen to twenty-four months.

The practice of repainting cars on a mileage basis has worked out very satisfactorily on this property. Experience indicates that cars in irregular service do not require painting as frequently as those performing all-day service. This has been emphasized particularly with irregular cars that are stored under cover.

A new painting problem has been introduced through the damage to car paint by contact with automobiles, trucks, etc. This makes repainting necessary at more frequent intervals than has been required in the past. On the Eastern Massachusetts system it is quite unusual to have a car come in for painting with side panels free from mars or scratches made by the tailboards of trucks. Quite often these scratches run the full length of the car body. Through substantial reduction in the cost of painting cars more frequent repainting has been made possible.

In 1915 the flat color and varnish system was used and the cost of repainting a double-truck car was $134. At that time painters were receiving the low rate of 29.6 cents per hour, and it required an average of 365 man-hours to turn out a finished car. An accompanying illustration shows the time required and cost for painting cars for the years 1910, 1915, 1920 and 1925. By referring to this it will be seen that the painting cost practically doubled during the war. The company changed over to an enamel system in 1920 and the cost of repainting a double-truck car was $257, with labor at 62 cents per hour. Paint materials during this interval increased from 100 to 200 per cent.

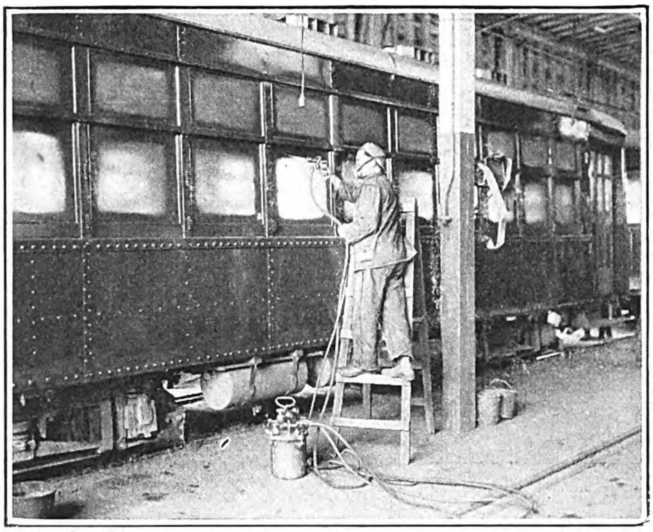
The method used with the enamel system consisted of removing the old body paint by burning off and then giving the outside a priming coat, putty and leveling coat and two coats of enamel. Doors and sash were stripped from the car, scraped and primed and were then painted with one coat of sash color and one coat of enamel. Repainting, as carried out in 1920, involved most of the work of an original finish, but with many refinements that are no longer considered necessary.

Early in 1921 the company set about to reduce the high painting cost and the results obtained were very gratifying. The cost of repainting a double-truck car at the present time is $69, with labor at 58 cents. This includes car washing and glass cleaning. This cost is considerably lower than that of 1913, although labor and materials have doubled in cost.

The reduction in cost of painting has been brought about through five important contributing factors: First, a change was made in the painting system, so

---

*Based on a paper presented at New England Street Railway Club, May 28, 1925.

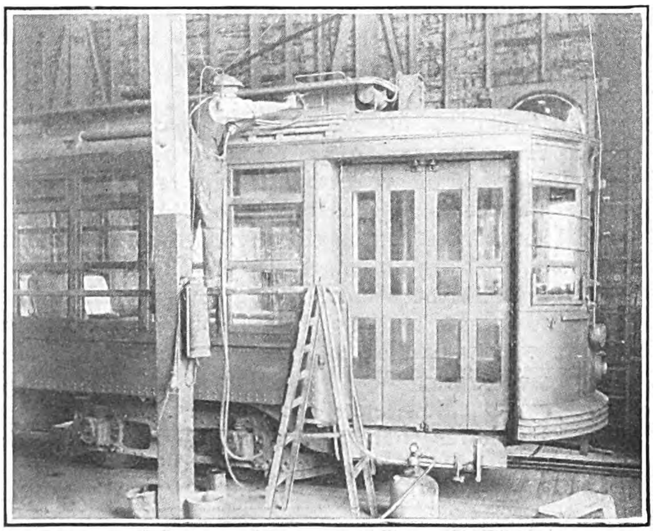


The Entire Car Body Exterior Is Spray Painted with Sash and Doors in Place

that the number of coats required was reduced from four to one; second, pneumatic spray painting was adopted; third, a simplified color scheme was adopted and many things previously considered essential in painting were eliminated; fourth, the schedule of operations was standardized, and fifth, a premium system of wage payment was adopted.

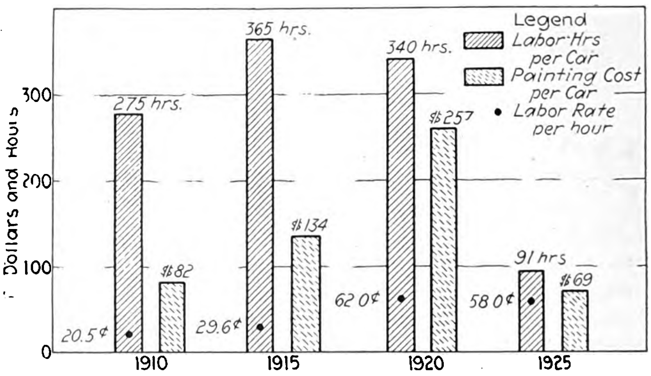
By gradually improving the paint condition of rolling stock during the past four years the company has been able to eliminate numerous coats of paint that were formerly considered necessary, and today a satisfactory finish is obtained with a so-called one-coat system. The comparatively low cost which has resulted has permitted more frequent painting and enabled the company to keep its cars in a better and more attractive condition.

A change from the hand brush method of applying these paints to the spray method was made early in 1921. This has proved of great assistance in reducing painting costs. At first, spray painting was used only for the application of paint to trucks and equipment, but has now been extended to include the entire body exterior, roof and floor. Not only has increased speed in painting resulted with less cost, but the work done is better, since brush marks are eliminated and cracks and crevices are covered more thoroughly. Experience shows that a spray gun operator will do the same work in from one-third to one-half the time required by the brush method. Since the cost of labor constitutes approximately 75 per cent of the total car painting cost, the economic value of the spray gun for painting railway cars is apparent. In addition to the use of spray painting for revenue passengers cars, the company has also employed this method extensively for painting snow-fighting equipment, service cars, buildings, trucks and buses.



In Spray Painting the Roofs of Cars Unique Wooden Guards Are Used to Protect the Upper Deck Sash

One distinct advantage of the spray gun method of applying paint comes from the fact that more material can be applied in a single application than with the brush method, and with correct air regulation a smoother and finer finish is secured. Approximately 10 per cent more material is now used with the spray gun method than was formerly used with the brush method. Of course, some of this material is lost in the process of atomizing and is carried off in the atmosphere, but the greater proportion of the additional material adheres to the car surface, and in consequence a better covering is obtained than was possible with a single coat hand brushed. The amount of paint which passes through the gun is under perfect control at all times, when the spray nozzle has once been adjusted and the air pressure on the paint reservoir determined. Air pressures required for spray painting vary with the consistency of the materials used and can be determined only by experience. The Eastern Massachusetts Street Railway uses 15 lb. of air pressure on the paint reservoir and 70 lb. on the nozzle for spraying the enamel. Roof paint is sprayed with 10 lb. on the reservoir and 50 lb. on the gun nozzle.



Time Consumed and Car Painting Costs for 44-Ft. Double-Truck Car at Five-Year Intervals from 1910 to 1925 Inclusive

An important point to be considered in installing a pneumatic spray system is to provide ample air capacity so as to have sufficient pressure always available for the full number of operators that will be employed. The compressor used by the Eastern Massachusetts Street Railway is a 50-ft. shop type, supplying air for three operators. Another important consideration is to make provision so that the air will be free from water, oil and grit.

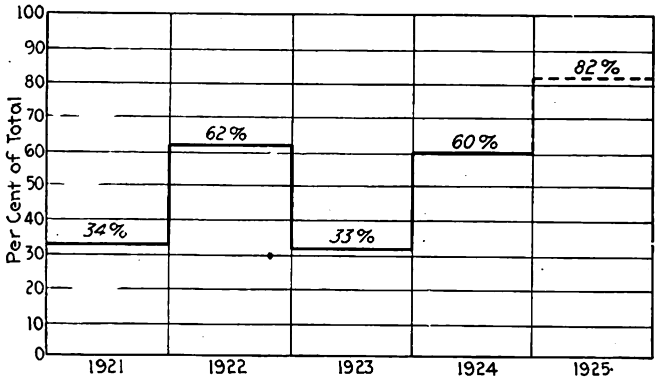
In painting cars operators are protected from the fumes by respirators, and during the four years that spray painting has been employed there has been no indication of any detrimental effect on the workers. Particular attention is paid to ventilating the shop by keeping the doors open in the front and rear when weather permits. In the winter season, when it is necessary to keep the doors closed, a 36-in. exhaust fan of 13,000 cu.ft. capacity is utilized to disperse the fumes. By providing for ample circulation of air in the immediate vicinity of the work much of the objection to spray painting by workers is overcome.

It was found that spray painting of cars could be made much more effective and economical by simplifying the car color scheme. The use of many colors complicates spray painting, since precautions must be taken to protect the parts which are not to be covered with the particular coat that is applied. The Eastern Massachusetts Street Railway has eliminated the use of a separate outside color for doors and sash and now spray paints the entire body from roof to sill with a standard light yellow color. The color scheme has been further simplified by spray painting the floors, seat frames, trucks and equipment the same color as the roof, which is an olive gray. Striping and other refinements have been eliminated and plain black car letters are used. Window guards are dipped in black enamel.

PREPARATION OF CAR FOR SPRAY PAINTING

In preparing a car for spray painting the trimmings, signs, seat cushions and window guards are removed and the car is washed thorougly both inside and out. A cleaner, mixed with soft soap and water, is used for loosening the dirt. This is followed by sponging off the interior and the outside is rinsed with a hose-connected water brush. As soon as the car has dried the roof is sprayed with one coat of oil paint. All bruised body parts and loose paint are scraped, sanded and primed.

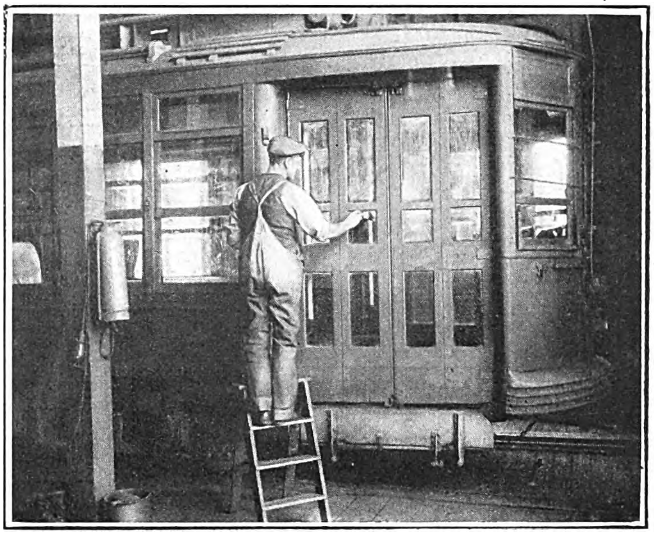
Since the sash and doors are spray painted without removing them from the car, provision has been made to prevent the paint from becoming attached to the glass. A semi-liquid substance, known as "Preservitt," is hand brushed on all outside glass. This material hardens in a few hours, and after the spray painting has been completed any paint sticking to the glass can be readily scraped off and the glass cleaned. Following the application of "Preservitt" to the windows the entire body is sprayed with one coat of yellow enamel. The remaining outside body painting consists of lettering and touching up.



Percentage of Total Revenue Cars Painted Annually During Last Five Years

REFINISHING CAR INTERIORS

Interior headlinings and bonnets are hand brushed with one coat of white enamel. Other interior parts, such as sash and doors, are usually hand brushed with a single coat of mahogany enamel. Trimmings and moldings on the inside are finished in natural wood and are given one coat of rubbing varnish. The majority of the company's cars are equipped with rattan seats. These are cleaned thoroughly and are bleached and varnished. Upon completion of the inside finish all glass is cleaned and polished and the floors, seat frames, heaters, steps, trucks and underbody equipment are sprayed with a coat of olive gray paint.



Applying "Preservitt" to Car Windows in Preparation for Spray Painting

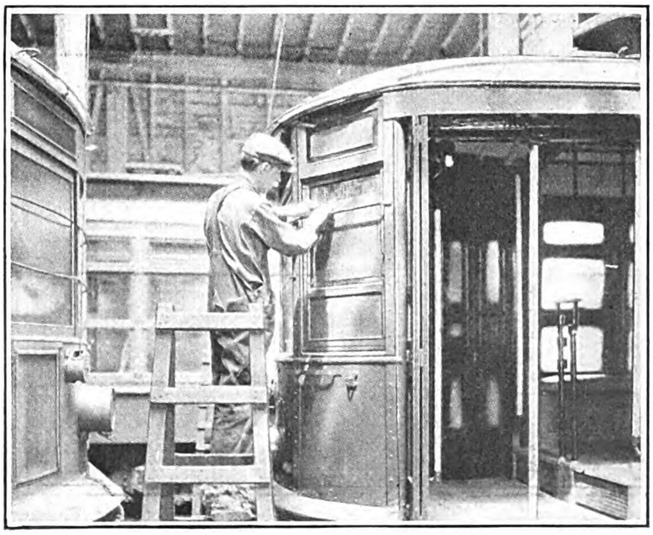
The man-hours required for repainting a double-truck, 44-ft., semi-convertible car by the preceding plan is shown in the accompanying table:

	Work Done	Man-Hours
1	Strip cars	1.0
2	Wash and clean inside and outside in preparation for painting	18.1
3	Apply "Preservitt" to all glass outside	1.8
4	Spray paint roof one coat	2.5
5	Scrape, sand and prime necessary parts	2.5
6	Spray body one coat enamel	4.5
7	Letter	3.0
8	Interior finish complete — hand brush one coat	29.0
9	Clean and polish glass	17.8
10	Spray paint floors, seat frames, heaters, platforms, trucks and equipment	2.9
11	Miscellaneous	4.9
12	Replace trim	1.5
13	Touch up after trim	1.4
		90.9

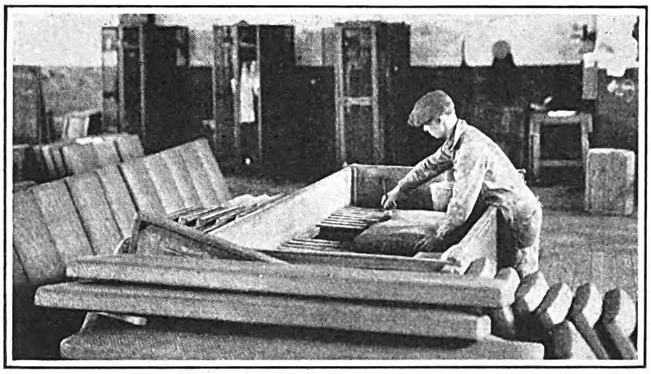
The actual cost of repainting the above car may be segregated as follows:

Painting (direct labor)	$30.00	
Paint materials	17.00	
Total	$47.00	
Washing car before painting, stripping and replacing trim and cleaning glass (direct labor)	$21.90	
Total cost of repainting car		$68.90

The corresponding cost for refinishing a standard single-truck safety car follows:



Removing "Preservitt" After the Completion of Spray Painting



Car Seats Are Cleaned by Applying the Cleaner with a Brush

Painting (direct labor)	$17.00	
Paint materials	11.00	
Total	$28.00	
Washing car before painting, stripping and replacing trim and cleaning glass (direct labor)	$12.54	
Total cost of repainting safety car		$40.54

A definite schedule of operation has been established for the painting of each type of car and all operations have been standardized as to time. This plan has permitted the use of a premium system of wage payment, and the men by diligent work are permitted to earn a bonus in excess of their nominal week's wages. Standardization of painting operations has played an important part in the program for lower costs. Accounts of the company show that for the year 1920 the expenditures for account 30B — car painting — were $21,635, for which 84 double-truck cars were repainted at an average cost of $257 per car. The direct savings for the four years, 1921 to 1924 inclusive, were $169,381, or an average rate of $42,000 per year. An analysis of car painting expenditures follows:

Number Double-Truck Cars Painted	Year	Actual Expenditures for Car Painting (Acct. 30B)	What Expenditures Would Have Been Under 1920 Painting System
263	1921	$33,145.00	$67,591.00
325	1922	35,434.00	83,525.00
232	1923	26,030.00	59,624.00
344	1924	35,158.00	88,408.00
		$129,767.00	$299,148.00
Saving			$169,381.00

The company's shops are not of the most modern type and as a result it has been impossible to utilize the spray painting method for interior painting of cars to the extent desired. Interior car painting requires extensive systems of ventilation, but the officials of the company feel that additional economies will be effected by spray painting car interiors.

The company is also experimenting with the lacquer system of painting cars, and in order to try this out has sprayed five experimental cars with lacquer paints of different manufacturers. Up to the present, it appears rather questionable as to whether the lacquer system of painting will prove superior to the enamel system now employed. It appears that lacquer materials cost more than enamel and that a greater number of coats are required. The final gloss does not compare with the gloss which the company is obtaining through the use of high luster enamel. The longer life of lacquer paint, however, may prove an ultimate economy.

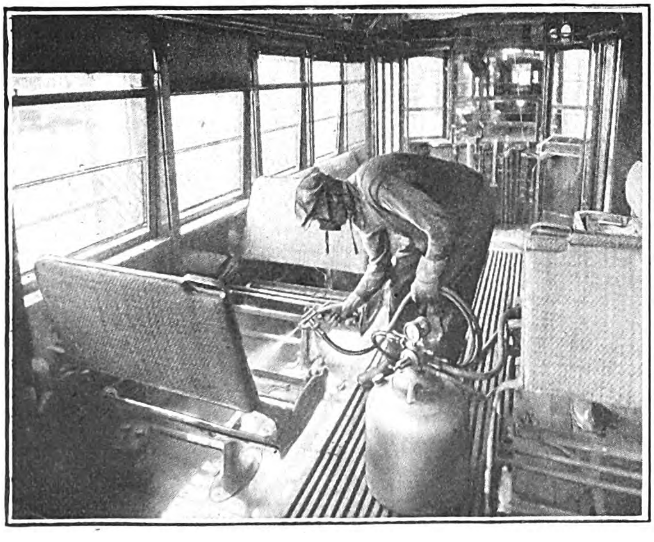
EASTERN MASSACHUSETTS STREET RAILWAY—COMPARISON OF PAINTING METHODS, YEARS 1920 AND 1925

PAINTING 1920—HAND METHOD

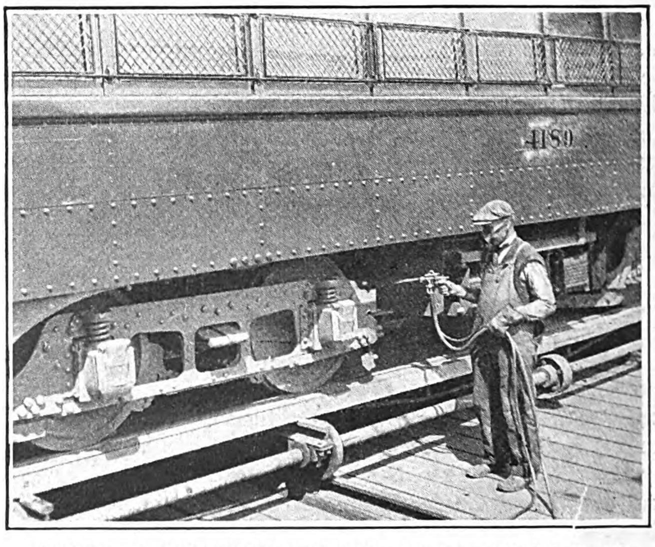
		Hr.
1	Strip, including doors and sash. Wash inside and outside	43
2	Burn off and scrape necessary parts	23
3	Sandpaper and prime	20
4	Putty and level coat	16
5	Sand and first coat enamel	18
6	Second coat enamel	12
7	Window guards—one coat lead, one coat enamel	5
8	Letter, stripe, etc.	15
9	One coat roof color	7
10	Truck, equipment—one coat. Fenders—two coats	11
11	Inside finish—bleach, shellac, one coat varnish	37
12	Headlinings and bonnets—two coats white lead color—one coat white enamel	26
13	Sash and doors—scrape outside, touch up, one coat sash color, one coat enamel; bleach inside, touch up, two coats varnish	50
14	Floors—one coat. Seat ends—two coats	12
15	Clean glass	20
16	Miscellaneous and refitting	25
	Total hours labor	340

PAINTING 1925—SPRAY AND HAND METHOD

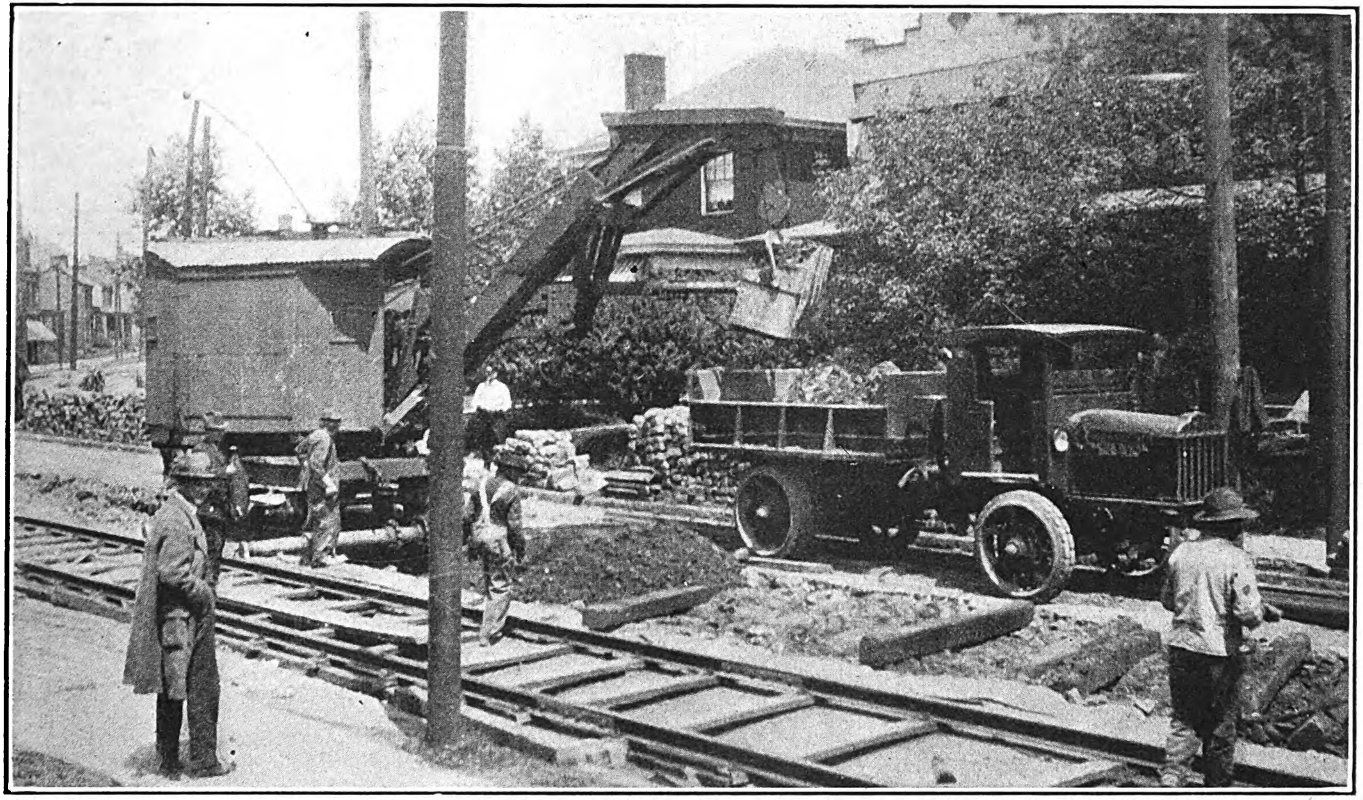
		Hr.
1	Strip car	1
2	Wash complete inside and outside	18.1
3	Apply "Preservitt" to all outside glass	1.8
4	Spray paint roof—one coat	2.5
5	Scrape, sand, prime necessary parts	2.5
6	Spray body—one coat enamel	4.5
7	Letter	3.0
8	Interior finish complete—hand brush one coat	29.0
9	Clean and polish glass	17.8
10	Spray paint floors, seat frames, heaters, platforms, trucks and equipment—one coat	2.9
11	Miscellaneous	4.9
12	Replace trim	1.5
13	Touch up	1.4
	Total hours labor	90.9



Parts Inside Cars that Are Spray Painted Include Seat Frames, Heater Risers, Floor and Platforms. The Color Used Is the Same as the Roof



Trucks and Under-Body Equipment Are Spray Painted and Operators Are Protected from Fumes by the Use of Respirators

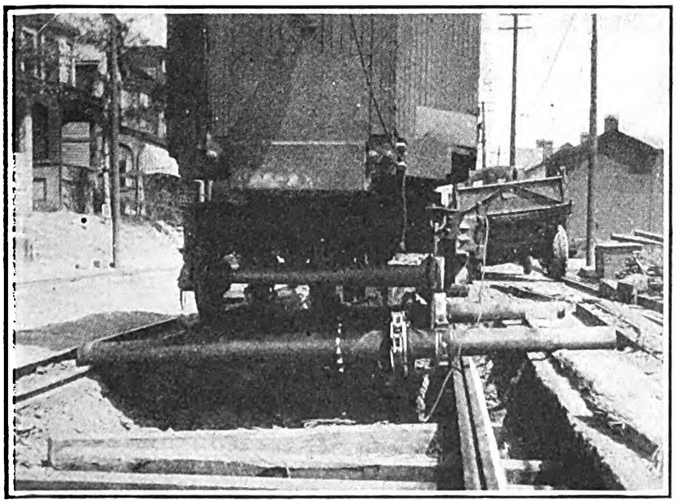


Pittsburgh Railways Uses Only Motor Trucks for Removing Excavated Material

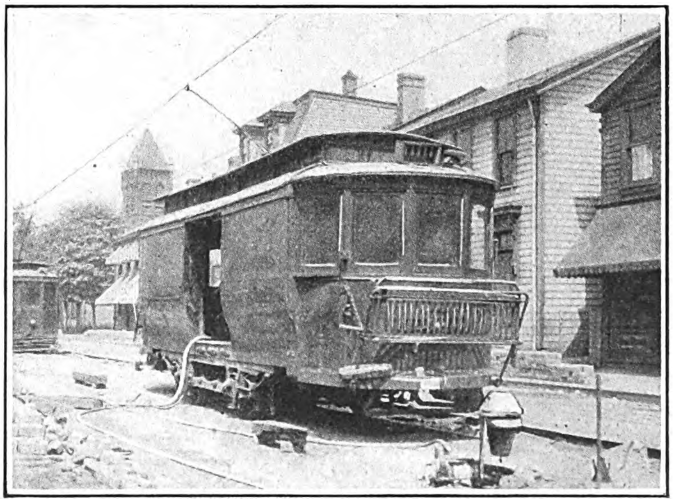
Mobile Equipment Used for Building Track in Pittsburgh

Extensive Reconstruction Work Done During Past Year — All Material Is Hauled by Motor Truck — Track Machinery Is Mounted on Service Cars or Equipped with Flanged Wheels for Movement by Rail

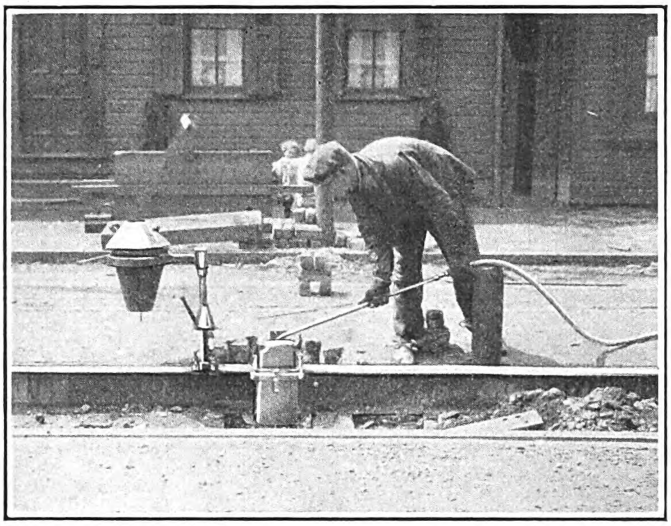
WHEN the present management took over the operation of the Pittsburgh Railways, slightly more than a year ago, the problem of track reconstruction was pressing. During six years of receivership comparatively little reconstruction work had been done. Of the 600 miles of track in the system, some 200 miles was in serious need of attention. With the completion of this year's program about 40 miles of track will have been entirely rebuilt. Extensive work has been done on the remaining track to put it in good operating condition. This maintenance is expected to meet the needs of the situation until the company is



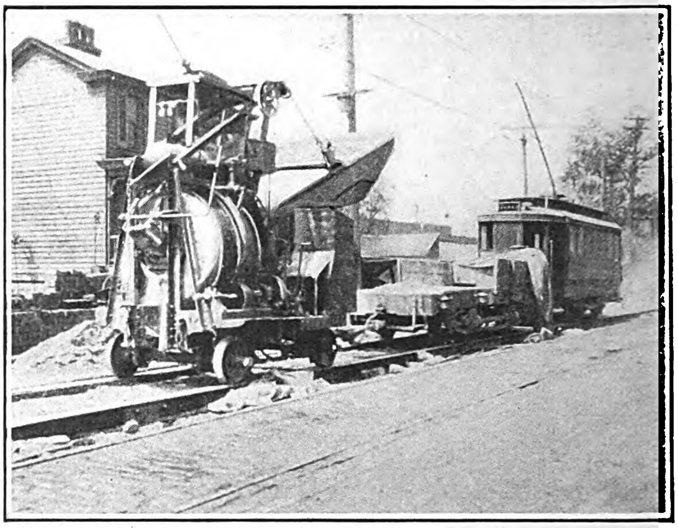
Chain-Driven Rollers Give Mobility to Electric Shovel. Note the Supplementary Rail



Service Car Provides the Compressed Air and Gasoline Mixture Used to Heat Welding Molds



Preheating the Mold for a Thermit Weld. A Mixture of Gasoline and Compressed Air Is Carried Through Rubber Hose



Concrete Train Showing the Flat Car on Which the Cement Is Carried. Sand and Stones Are Delivered by Motor Truck

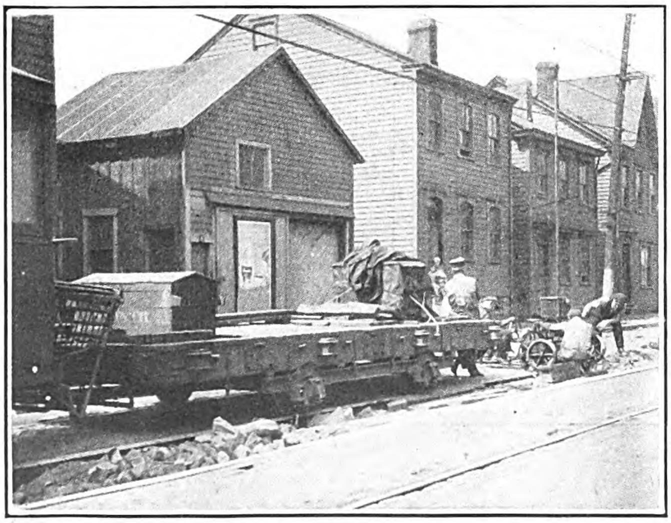
able to undertake the rebuilding of all track that is worn sufficiently to require replacement.

Much labor saving machinery is used by this company in its track reconstruction work. Electric shovels are employed to tear up the old pavement and foundations. These shovels have been especially equipped with chain-driven rollers to give them mobility. In streets where the railway has double track one track only is taken up at a time. An extra rail, as shown in the accompanying illustration, is laid on the inside ends of the ties of the track which remains undisturbed. Planks are laid end to end on the solid pavement on the curb side of the street. Rollers for the electric shovel extend from the extra rail to the planks and permit easy movement of the apparatus. This arrangement of supporting the machinery independently of the roadbed has been found to be very satisfactory. When only one track exists in the street, a temporary track, as shown in the accompanying illustration, is laid near the curb and cars are operated over this during construction work. Under such circumstances the shovels are moved on two rows of planks instead of using the rail fastened to the ends of the ties. A short length of old rail laid on its side is used as a wedge under the roller.

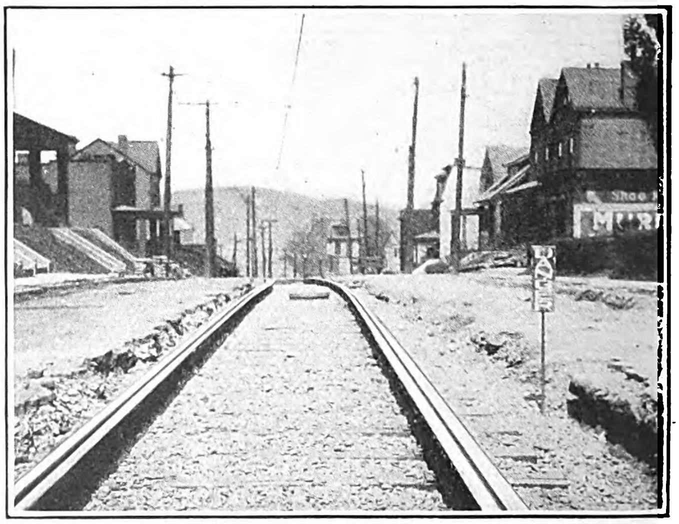
Material excavated by the steam shovel is hauled away by motor trucks, the use of service cars for this work having been practically discontinued. It is thought that fewer interruptions to passenger service are likely to occur if the tracks are kept free of work cars. Strong efforts have been made by the company to eliminate vehicular interference with car operation, and it felt that it would be inconsistent to permit such interference by work cars. Motor trucks also have greater flexibility of movement and material can be disposed in locations not accessible to the cars. New material for the work is brought by motor truck also. An exception to this, however, is made in the case of rail, which is transported by a special rail-carrying car of unusual length. This is simply a framework supported on two trucks and capable of carrying sixteen rails.

Recently a change to round gravel ballast has been made by the railway. Previously broken stones were used and, later, slag. The gravel, however, is available in large quantities at a low price from local contractors, who dig it up from the beds of nearby rivers. While it is not considered to be quite as satisfactory as the broken stone on account of its having rounded edges instead of sharp corners, it is considerably cheaper and it serves the purpose satisfactorily.

Wood ties are used and A.E.R.E.A. standard 9-in. grooved girder rail. After the gravel ballast has been thoroughly tamped a shallow layer of concrete is poured



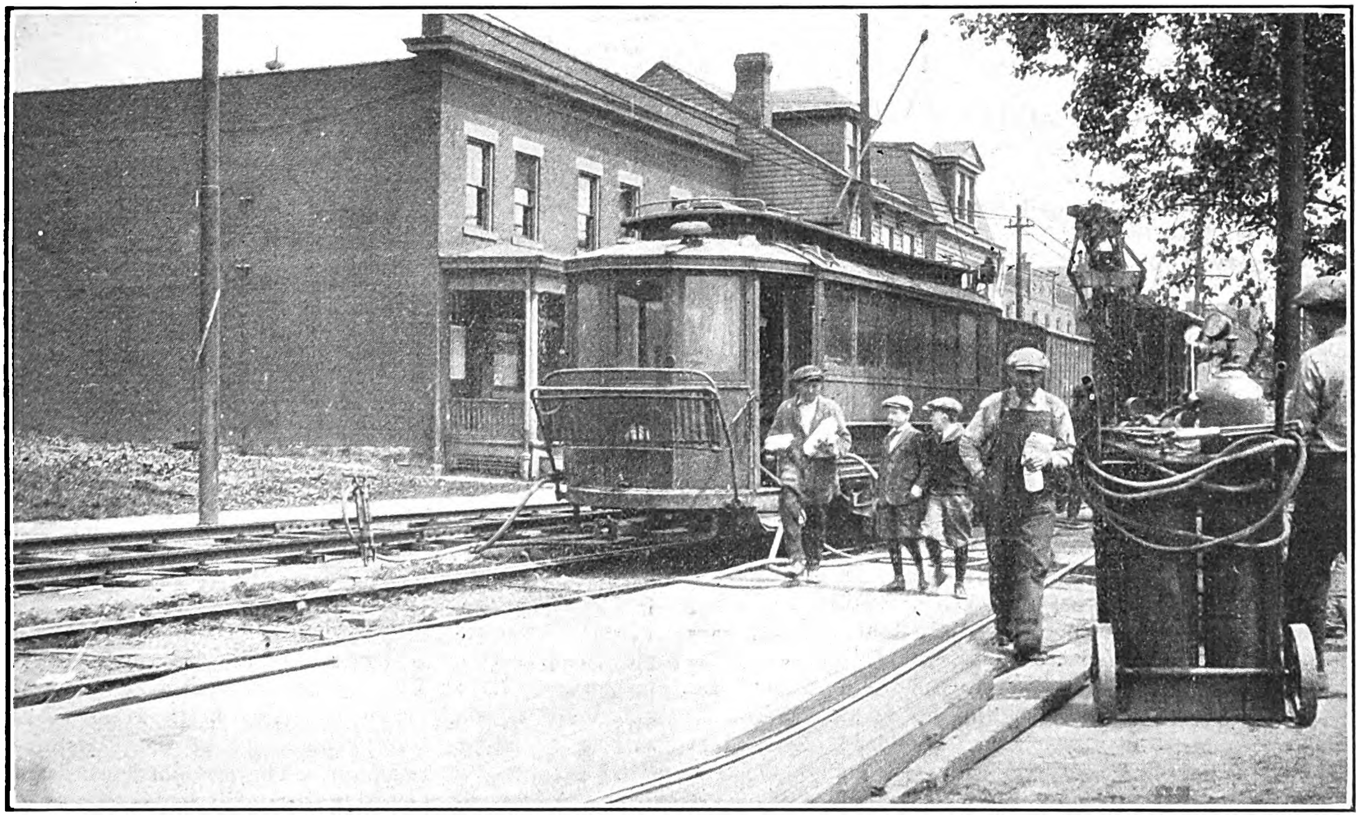
Welded Joints Are Ground Smooth with a Rotary Grinder Which Is Carried on a Flat Car



Gravel Secured from the Nearby Rivers Is Now Being Used Extensively by Pittsburgh Railways as Ballast covering the tops of the ties and forming a foundation for the pavement. Instead of being done by the company, as used to be the case, paving work is done by the municipal authorities under the new franchise arrangement which is in effect throughout most of the territory served by the railway.

All rail is thermit welded. Apparatus for preheating the molds and rail is carried in a service car. A mixture of gasoline and compressed air is made in the car and carried through rubber hose to the welding mold as shown in the accompanying illustration. A burner is attached to the end of the hose and adjusted to position for heating. It is allowed to remain in this position, burning for as long a time as may be necessary to preheat properly. Two such burners and hose are carried on the car.

Apparatus for supplying compressed air to the pneumatic pavement breakers and tamping machines has also been mounted on a service car. A Chicago Pneumatic company air compressor has been placed in the body of an old passenger car and outlets on the side of the car are provided for connecting the hose as shown in an accompanying illustration. The capacity is sufficient to operate simultaneously four pavement breakers or eight tampers.



Pneumatic Pavement Breakers and Tamping Machines Are Supplied with Air from a Compressor Mounted in a Service Car

CONCRETE MIXER HAS FLANGED WHEELS

Flanged wheels are provided on the concrete mixer so that it, too, forms a part of the work train. Coupled to it is a flat car carrying the cement. At one time it was the practice to carry also the broken stone and sand for the concrete mixture on this flat car. More recently, however, this practice has been changed and now only cement is carried. Sand and stone are transported by motor truck and dumped in the street near the work. Cement, however, being subject to deterioration from the weather, cannot be distributed in this way and permitted to remain exposed.

After the thermit welds have been completed they are smoothed down by a rotary grinder. This grinder is transported from place to place on a flat car, skids being provided by which it is rolled off and on the car.

New Type Track Pavement Tried in Rochester

COMBINATION asphalt and brick paving is being tried by the way and structures department of the New York State Railways, which is completing the work which was started on Goodman Street, Rochester, last year. This improvement extends from the end of the brick pavement at Fernwood Avenue northward to the new loop which was constructed last year near Norton Street.

The old track was laid in 1907, using 9 in. groove rail, wood ties and gravel ballast. The track was never paved and earth coming up to the top of the rail caused a very muddy condition in rainy weather.

The new construction consists of the railway's standard type of construction, 7 in. high T rail being used with wood ties and bar joints. The joints are of the eight hole standard, with 1 in. drive fit bolts and an Abbott plate underneath the rail. A feature of the construction is the type of pavement used which consists of asphalt between the rails but with a brick header laid on either side of the rail. This is the first time this type of pavement has been used in the car tracks in Rochester, and if it proves successful it is stated that similar pavement may be used in the future, as it is less expensive to construct than ordinary brick pavement and is more quiet.

Equipment Maintenance Notes

Pneumatic Mortising Clamp

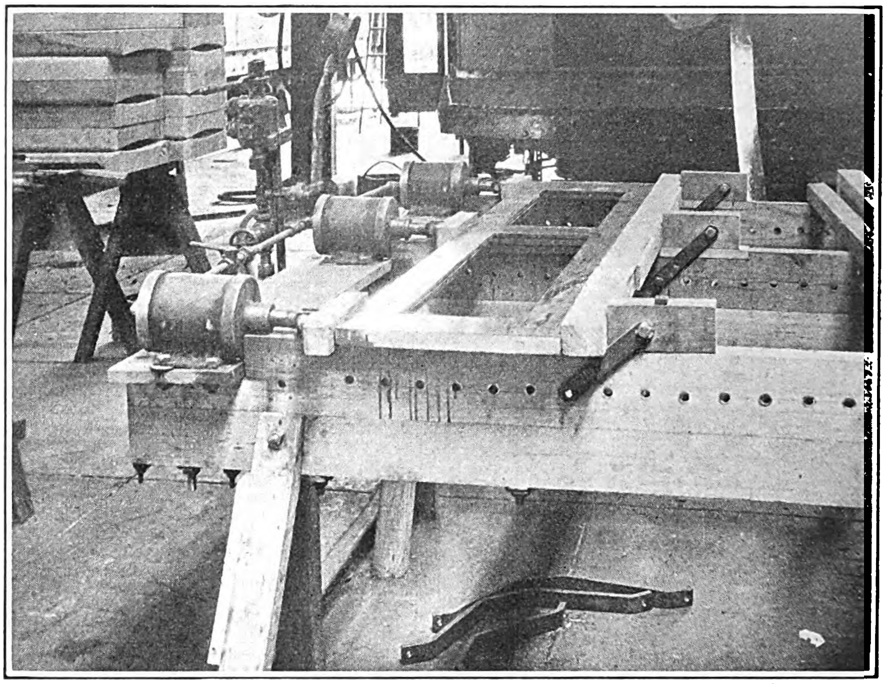
By J. L. Brown

Master Mechanic Dallas Railway,
Dallas, Tex.

Hand clamps or wedges for holding doors or sash while gluing up mortises are widely used. At best, however, these customary methods are slow and take a great deal of time for a comparatively simple operation. Study of this subject in the shops of the Dallas Railway led to the development of the pneumatic clamping device shown in the accompanying illustration.

Three small air cylinders are fitted to a common supply pipe from the shop compressed air line. An ordinary engineer's valve admits air to the cylinders, and an adjustment valve below regulates the total pressure that can be applied. Each piston is fitted with a wooden shoe on the end, which presses against the edge of the door or sash to be glued up.

As is shown in the illustration, the entire device is mounted on a special table. Each of the air cylinders is fastened at the end of one of the cross-members of this table. These members are bored with a number of equally spaced holes, so that the spacing blocks shown in the illustration can be moved to any desired position to fit a particular size of work. These blocks are held in position by bolts through the holes in the table cross-members.



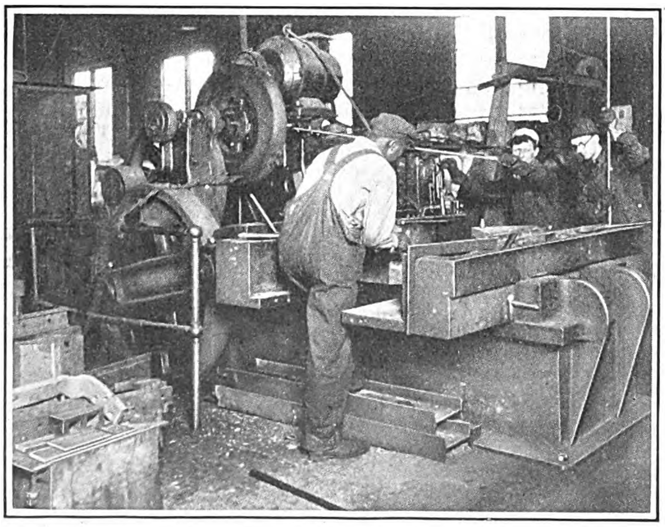
Pneumatic Clamp for Holding Doors or Sash While Gluing Mortises

This pneumatic mortising clamp in the shops of the Dallas Railway reduces the time for gluing up doors or sash. The three small pneumatic cylinders are connected to the shop air supply line, and the wooden shoes on the ends of the pistons bear against the edge of the door or sash under construction.

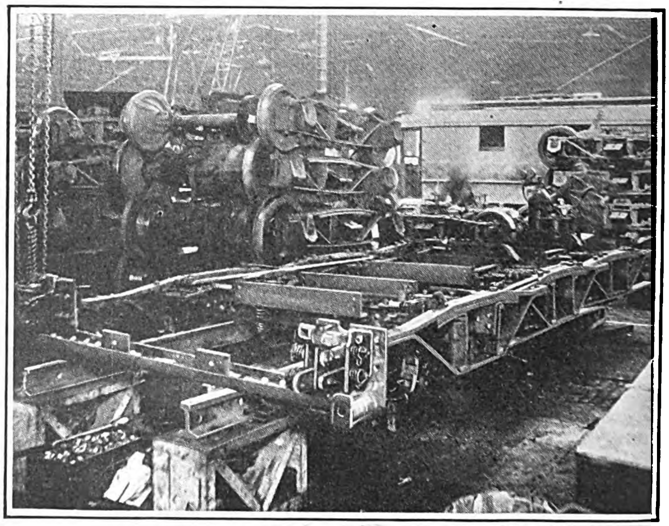
In practice, the spacing blocks are adjusted to the proper position, and the door or sash is glued up and set in place on the table. Application of air forces the tenons tightly into place. When a tight joint is encountered a blow with a mallet is usually sufficient to drive the joint home under the air pressure and provide a close fit.

Making Truck Parts in Bulldozing Machine

For some time past an extensive program of making arch-bar trucks has been in progress at the Homewood shops of the Pittsburgh Railways. The standard truck now being used under low-level cars is known as the M-25. This supersedes



Bending Truck Parts to Shape in a Bulldozing Machine in the Homewood Shops of the Pittsburgh Railways



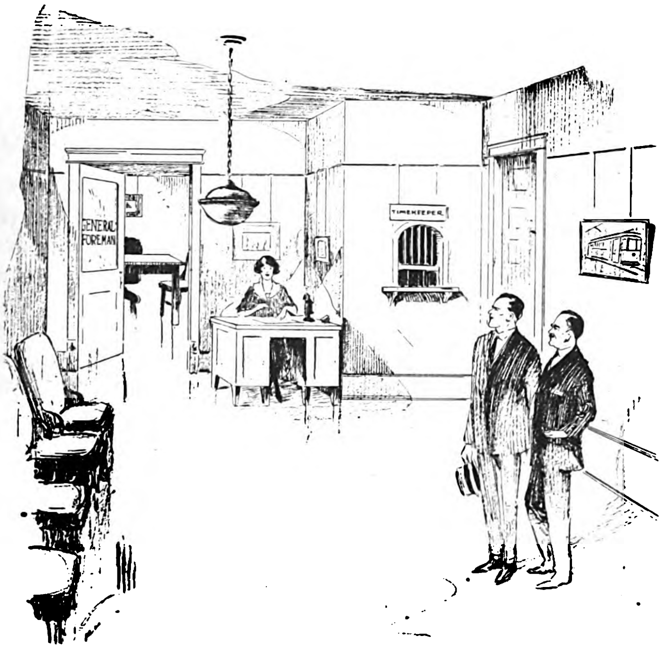
Trucks of This Type Are Built in the Railway Shop, Standard Structural Shapes Being Used Wherever Possible

an older type known as the M-24. All trucks for new cars are supplied by the manufacturer, but the railway itself is building the trucks of M-25 type as they are needed to replace worn-out M-24 trucks. New trucks are built in the shop also to equip the motorized trail cars, of which a number have already been placed in service and more are planned.

In making trucks, standard structural steel shapes are used wherever possible to avoid the necessity to make forgings. Drilling is done by jigs. Practically all the truck members are bent to shape in the bulldozing machine. This process is shown in an accompanying illustration. A large oil furnace alongside the machine first heats the parts. They are then placed on the table of the bulldozing machine and bent to shape by means of dies. Present production capacity is two trucks per day.

Dick Prescott Returns Home

And Sees Evidence of Changes



ONCE more Dick Prescott and Steve White, engineer of equipment and carpenter foreman of the Consolidated Railway & Light Company, found themselves waiting just outside the little office of Thomas Mullaney, general foreman. They had reported early on the morning following the return from their trip of inspection, and arrived a few minutes before Mullaney.

As they were waiting to report to their chief before resuming their regular duties, Dick and Steve were conscious that a decided change had taken place in the atmosphere of the little office during their comparatively brief absence. The sullen-faced youth who formerly occupied the desk at the little window under the word "Timekeeper" had been displaced by a comely young woman who extended a cheery "good morning" as she passed Dick and Steve on the way to her post.

Back in the office beyond the partition that separated it from the "reception room" outside several other new faces were visible. Even the neatly painted sign on the door was new. Both Dick and Steve were quick to feel the cordial invitation it extended in comparison with the former challenge of the word "office."

A fresh coat of paint had been given the interior of the room, and the long bench along one wall had been replaced by a number of serviceable but comfortable chairs. Thomas Mullaney's small office, of which the door stood open, also presented a rejuvenated appearance. The old battered roll-top desk, usually crammed with the papers accumulated from an imperfect filing system, had given way to a flat table whose clear-swept top gave an impression of being "stripped for action." Linoleum of a neutral shade covered the floor, and several office chairs were grouped about in a fashion that indicated the stage setting for a conference instead of the long customary solitary interviews "on the carpet."

"Gee," said Dick, when he and Steve had taken in the changed appearance and tone of the office, "this place is beginning to look like a real business establishment."

"I should say so," replied Steve. "If it weren't for Jack and Bill in there, I'd begin to think we were still on our trip. This sure is some improvement. Begins to look like the old man's started already to pep things up."

"He certainly is on the right track. I'll never forget the first impression I got when I came in here looking for a job. If I hadn't needed one so darn bad I don't believe I'd ever have gone through with it."

"I can understand how you felt about it, all right. But some of us fellows that have been sawing wood for eight or ten years had got to where we never expected anything much better. I certainly can imagine what some of the old gang are saying about this change in conditions. Some of them, I'm afraid, are not going to keep in step and will be in for a rather uncomfortable time."

"It's always hard to pull out of a rut when you've let yourself get into one. However, if we can make the gang see that a railway shop can do better work if it's run like any other up-to-date business establishment, and all pull together, we ought to be able to get under way without many casualties."

"I wish some of the other fellows could make a trip like this one we've just finished. Seeing how the other fellow does it certainly helps to make you realize that there are several ways of doing a job, and that the old way isn't the best, just because you've been following it for twenty years."

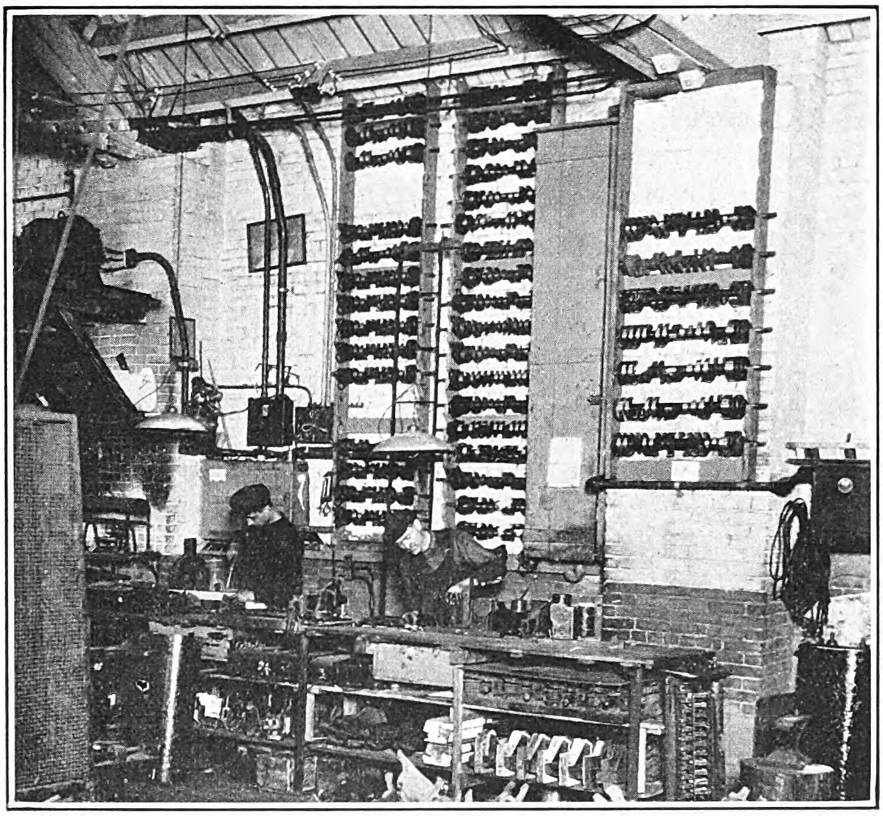
Dick and Steve were so intent on their discussion that both were a little startled as Thomas Mullaney himself opened the outer door and stepped into the reception room.

Safety Treads Prolong Life of Car Floor

EXPERIENCE of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., indicated some time ago that the platform floors on its safety cars were wearing out more rapidly than the floors elsewhere throughout the car. This was accounted for by the fact that the platform floors were of pine, whereas maple was used in the car body. The latter type of flooring had a life of five or six years, whereas the platform floors were wearing out in 1½ to two years. To remedy this situation, cast-steel safety tread has been installed on the platforms. Three pieces are used, one immediately inside the door, one in the middle of the platform, and a smaller piece in front of the motorman's seat. It is expected that with this arrangement the plaform floors will outlast the maple flooring in the body of the car.

Wall Rack for Controller Drums

AS THE space for overhauling controllers is quite limited in the 155th Street shop of the Eighth Avenue Railroad, New York City, wall racks for holding controller drums have been found particularly advantageous. These are constructed of wood with notches into which the ends of the shafts rest, and they reach entirely to the top of the side wall. An iron ladder is used to place



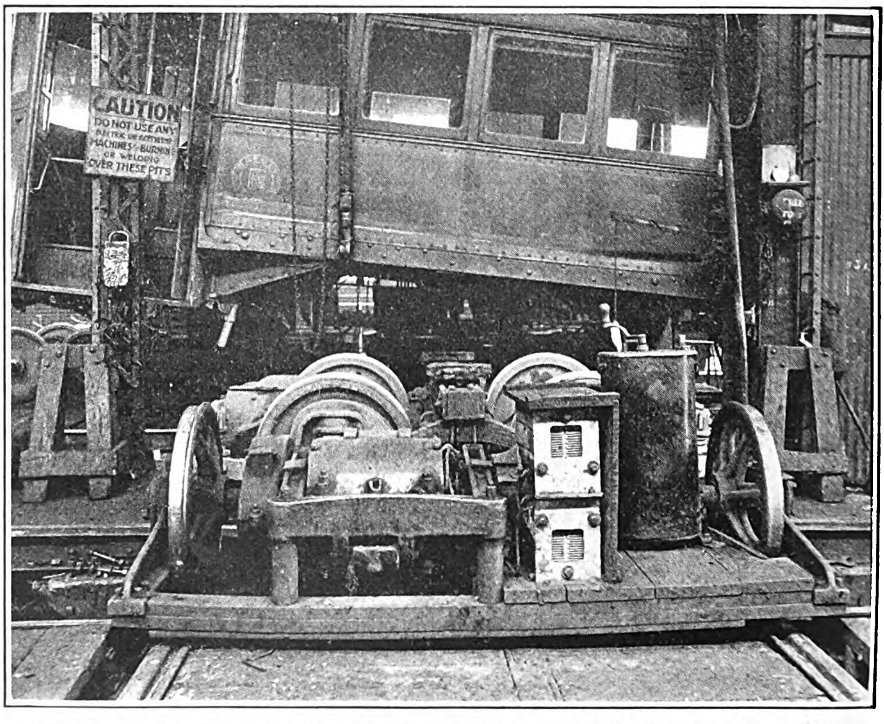
Overhauling Bench of Eighth Avenue Railway, New York, with Rack for Controller Drums Against Wall in Rear

and remove drums from the upper parts of the rack. With this arrangement storage space for approximately 50 drums has been provided directly behind the controller overhauling bench.

Small parts used in the overhauling of controllers are kept in a closet at the back of the bench. With an arrangement of shelves properly labeled, much time is saved in this overhauling work.

Transfer Table Used for Removing Trucks

FOR removing a truck from under a car body in the repair shop a transfer table is used in the Homewood shops of the Pittsburgh Railways. This transfer table operates across the end of several tracks in the machine shop. The car requiring repair is run onto one of these tracks and stopped with the truck on the transfer table. The car body is then lifted up by means of two Sprague 2-ton hoists hooked under the frame, as shown in the accompanying illustration. After the car body has been raised the transfer table is moved out, bringing the truck with it. The latter is taken over to a repair track and pushed off the transfer table. By a reversal of this process the truck is returned to its position under the car.



Electric Hoists Raise the Car Body and the Transfer Table Removes the Truck

One Motor Arranged to Do Three Jobs

TO UTILIZE advantageously the spare time of a motor designed for track grinding work, the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has arranged a bench to which the motor may be bolted for shop work. In this position, it is in line with the shaft driving pulley and in an emergency can be used to supply power to the main shafting. It has been equipped also to be connected to a Westinghouse commutator slotter and can be thus used on many occasions when there is no track grinding to be done.

Relining Compressor Cylinders

CAST-IRON sleeves are used by the Dallas Railway for relining compressor cylinders. A self-aligning vertical boring mill, made by the Storm Manufacturing Company of Minneapolis, is used for boring out the worn cylinders so that a sleeve can be pressed into place. The amount of material removed depends on the thickness of the compressor cylinder walls. As an average, about $\frac{1}{2}$ in. diameter is removed to provide for pressing in the bushings. This permits the use of a sleeve with a finished wall thickness of $\frac{1}{4}$ in.

Sleeves are purchased as rough castings from a local foundry. When received they have walls about 1 in. thick. These are first finish-turned to the proper diameter on the outside, about 0.004 in. being allowed for press fit.

After the sleeves are pressed into the cylinders they are bored out on the inside to the proper diameter. When the outside is turned a small shoulder is left at one end, to serve as a stop when the sleeve is pressed into place.

New Equipment Available

Improved Line of Band Saws

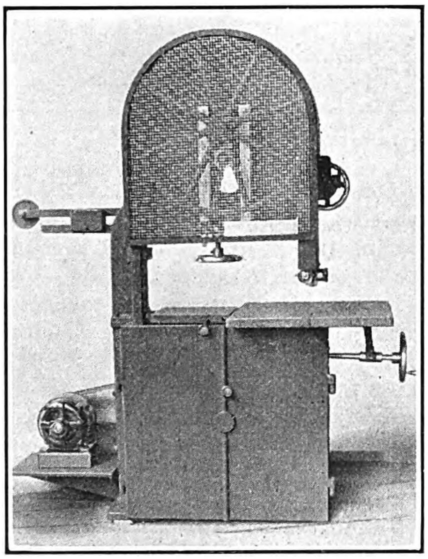
SEVERAL improvements have been incorporated in a new line of band saws by the American Saw Mill Machinery Company, Hackettstown, N. J. These machines are designed particularly for convenience in operation and include safety guards protecting every point of contact with the saw except the actual cutting space. The line includes sizes ranging from 20 in. to 36 in. Either motor or belt drive may be used.

The upper and lower wheels of the 30-in. size are of the spoked type, with a 30-in. diameter and a 2-in. face. The lower wheel is inclosed in a compartment with iron doors, or it may be covered by wire mesh doors similar to that which covers the front side of the upper wheel. The machines are furnished with only the front or door guards, the space back of the wheel being left open. In an optional design the lower wheel can be equipped with a special brake attached to the bolt shifter to stop rotation of the wheel quickly. Both wheels are keyed to ground steel shafts. The collar is forged solid on each shaft. The hub of the wheel is firmly held against it by a large nut. Both the top and bottom shafts run in extra long bearings, which are made in two parts to take up wear. These are adjustable to provide for alignment of the saw blades. The upper wheel bearing is hinged for tilting of the wheels by means of a lever located in a position convenient for the operator.

A special anti-friction saw guide is provided. This is mounted on a counterbalanced square post, and a hand wheel is used for raising and lowering the guide post so that the workman may devote his entire attention to the work. The slide head which carries the upper wheel bearing slides in a groove in a column and is held in place by steel gibs.

The table for the saw is 20 in. x 20 in. x 32 in. It is made rigid by extensive ribbing on the under side. A hand wheel and screw are provided for tilting the table to 25 deg. for bevel sawing, and a brass index registers the angle.

Where motor drive is used, a 2 to 3-hp. motor is recommended. The 2-hp. size is sufficient for ordinary shop work, but the 3-hp. is preferable for heavy work. The design is such that the motor can be set on the floor and bolted to a pulley drive or set on a special bracket attached to the body of the machine and provided with a gear drive.



Motor-Driven Band Saw with Special Protection Safety Guards

Light Bus Chassis

STUDEBAKER has just put into production two bus chassis in which the outstanding features claimed will be low initial cost, economy in operation, dependability under hard usage and passenger car comfort. Two sizes, each with the same unit 75-hp. engine, are being presented. Model A-158 has a wheelbase of 158 in.; Model M-184, a wheelbase of 184 in.

Low cost of operation comes from the experience of the thousand and upward Big Six chassis to which bus bodies have been fitted. Many of them have run from 100,000 to 300,000 miles.

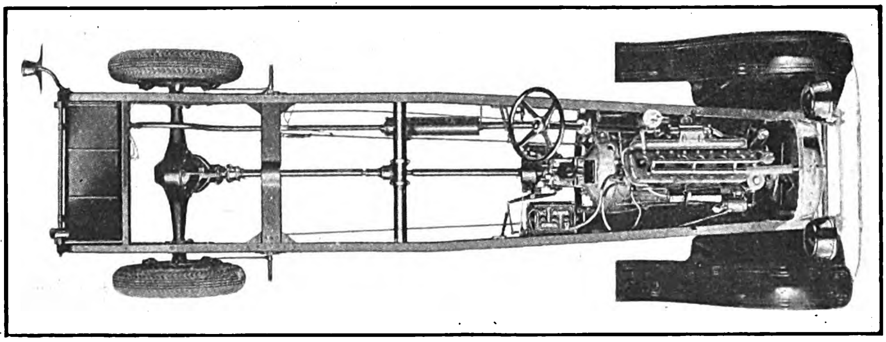
The Big Six 75-hp. engine is used. This is a unit power plant, with single-plate dry disk clutch, set in its own subframe to eliminate road torsions. It is of the L-head type, cast en bloc with removable head, bore 3⅞ in., stroke 5 in.

The carburetor is 1½ in., double jet, two range, specially designed for the Big Six engine. Spark advance is automatic, timed by the engine itself. All electric wiring is in metal conduit and the whole ignition system is water-proofed.

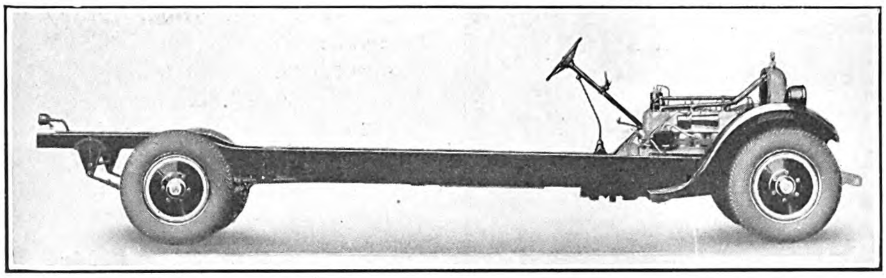
The semi-floating rear axle is housed in truss construction with one removable plate to admit directly to the differential. The axle shaft diameter is 2⅛ in. Springs are semi-ellipic, 2 in. wide. The front springs are 38 in. long, those at the rear 56 in. long. Fenders (on the front only) are of 19 gage pressed steel, doubly crowned and concentric to the steel disk wheels, which carry tires 34 x 7.3 in. in size, six ply. Dual rear wheels and tires are optional on the M-184 chassis.

Service brakes are the Studebaker hydraulics on four wheels. Hydraulic equipment is at the rear of the transmission case, where two opposed cylinders, actuated by a force pump, impart a 60-40 proportioned force of 200 lb. on rear and front wheels, respectively. The pump is driven by the propeller shaft. The emergency brake works with the direct pull of a latching pistol grip projecting from under the center of the instrument board.

The frame has side members 7$\frac{1}{16}$ in. deep, of $\frac{3}{16}$-in. steel, with 2¼-in. flanges on the Model A-158. On the Model M-184, the flanges are 3 in. wide and the channel is 8 in. deep at the center with a 4½-in. channel beam running 40 in. beyond the rear axle. On the Model A-158 the seven regular frame cross-members are



The Studebaker Bus Chassis Carries a "Big Six" Power Plant



The M-184 Chassis Is Suitable for 15 to 20-Passenger Bodies

supplemented by a 3½-in. tubular cross-member. On the longer model, this supplemental bracing consists of two 3½-in. tubular cross-members in the center and an additional 2½-in. tubular cross-member at the rear.

The propeller shaft is in two sections with center ball-bearing steady rest, and two Spicer universal joints. The gear ratio on both models is 4.7 to 1.

Model A-158 is suitable for twelve to fifteen passengers, and model M-184 for fifteen to twenty passengers.

Concrete Pole Design Reduces Maintenance

A DESIGN of concrete pole to meet the demand for longer life, greater strength and increased safety factors in trolley and transmission lines has been incorporated in the Hollowspun concrete poles manufactured by the Westinghouse Electric & Manufacturing Company.

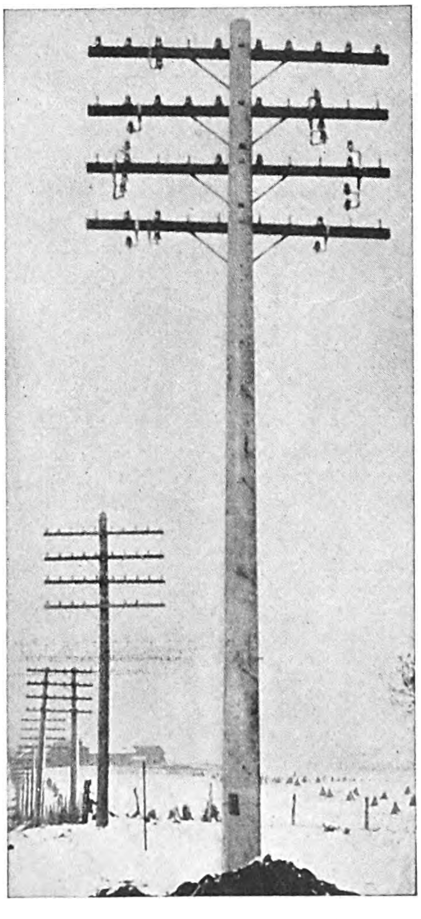
Hollowspun poles are built by a centrifugal process and are free from electrolytic corrosion due to the density of the concrete. Reinforced concrete pole construction requires a relatively high percentage of tensile and shear reinforcement. In order to obtain this, the section of the individual rods must be kept down and these are then given some additional horizontal wrapping to insure against shear failure. The resulting mass of reinforcement commonly called a cage is so dense that it is not possible to force concrete into place by spading or tamping.

In the Hollowspun process, the reinforcing steel, after being accurately computed for the particular class of pole to be made, is held rigidly in place. The complete reinforcing cage is then placed in a horizontal form and held at the desired distance from the surface of the form by concrete buttons which become part of the finished wall of the pole.

Concrete is added and the entire form rotated at high speed, developing centrifugal force sufficient to compact the concrete into a very dense wall, leaving a cylindrical opening in the center running through the length of the pole.

Removable steps may be made for these concrete poles by embedding bronze inserts in the concrete and using these as inserts for holding the ordinary pole steps. Standard cross-arms and other equipment now in use can also be applied to these Hollowspun poles.

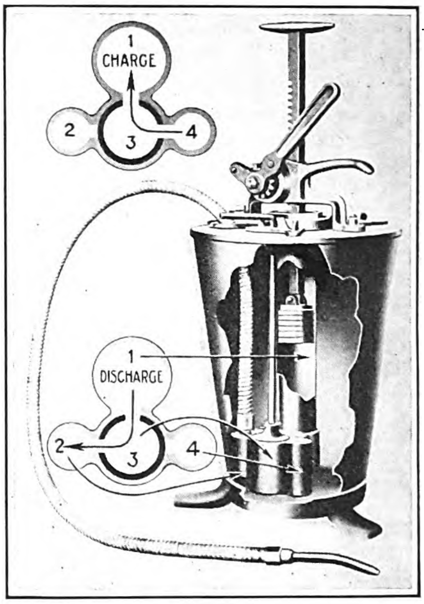
The use of these concrete poles for transmission lines makes possible a considerable increase in the capacity of the lines, and thus permits the reduction of the number of poles per mile, or an increase in the number of wires without reducing the factor of safety. Maintenance costs are practically eliminated by the use of these concrete poles.



Hollowspun Telephone Poles in Service Under Severe Weather Conditions

Bucket Pump Removes and Applies Grease

A GREASE bucket with hand-operated grease gun incorporated has been brought out by the Manley Manufacturing Company, York, Pa. It has a capacity of 30 lb. of grease or oil and is self-measuring, since one complete stroke of the pump discharges 1 lb. of lubricant. Two methods of operating the equipment are provided—by direct pressure on the handle, or by a ratchet lever with an 8 to 1 ratio.



The Three-Way Construction of the Pump Mechanism Permits It to Be Used Either to Force Clean Grease in or Remove Old Grease

The three-way construction shown in the illustration permits the device to be used as a syringe, to remove dirty grease, as well as for a pump, to put in clean grease. As indicated, No. 1 is the main cylinder; No. 2, a discharge port leading to the hose; No. 3, a three-way cage valve, and No. 4, the suction port leading to the contents of the bucket.

Grease or oil is sucked into the cylinder (where arrow is pointing) by the drawing up of the piston. The next step is to move the lever at the top of the bucket 90 deg. to the right, when the ports are in the position shown in the lower insert. Pushing down the piston forces the grease out of the cylinder and through the hose into the grease chamber of the equipment to be lubricated.

With the ports in position as shown in the lower insert, the old grease can be sucked into the pump cylinder and discharged into a waste pan without changing ports.

Association News & Discussions

Canadians Discuss Car Design and Ride Merchandising

Annual Meeting, Held at Montreal Last Week, Best Attended in History of Canadian Electric Railway Association—Lively Discussion Brings Out Many Points on Merchandising Transportation and One-Man Cars for City Service

FOR the second time the Canadian Electric Railway Association has held a joint convention with the Canadian Electrical Association. Unlike many joint conventions, the common features included only the exhibits and entertainment features. Each association held its own sessions, so that the full program for each group was devoted to live subjects.

Railway sessions were held on June 10, 11 and 12, with D. E. Blair, general superintendent Montreal Tramways and president of the Canadian Electric Railway Association, presiding. Much interest was manifested in the paper by Walter Jackson entitled "The Business of Selling Rides." The paper is abstracted elsewhere in this issue. In presenting his paper Mr. Jackson pointed out that the management should use every way possible for making the company and its service popular. While he has been hailed as the proponent of the weekly pass, he feels that this has value not so much in itself as in being part of a plan for popularizing the railway.

RAILWAY BUSINESS NOW SELLING RIDES

A lively discussion followed the presentation of Mr. Jackson's paper. E. M. Walker, president Schenectady Railway, pointed out that with the automobile a big factor in local transportation, the business of the railway is now largely one of selling rides. Success in this line depends to a considerable extent on the removal of all sources of irritation. Among other things, he mentioned transfers that are easy to issue, inspect and check. As another instance, he spoke of one road where 7-cent tokens are sold. These are dispensed in envelopes containing seven tokens and one cent. The amount, 50 cents, is marked plainly on the envelope, so that the sale is made without the necessity of the conductor handling change or the tokens.

H. E. Weyman, manager Levis Tramways, stated that in his territory he arouses interest in the sale of weekly passes by giving away a pass each week to the holder of the lucky number in a drawing.

D. W. Harvey, manager Toronto Transportation Commission, told of the use of posters in Toronto for advertising the local museum. He stated that a large increase in riding to that point was a result. He felt that where the riding habit is as high as it is in Toronto, namely 365, it is dangerous to make changes in the rate of fare. Mr. Jackson replied that there really is no limit to the riding habit so long as people may be found on the sidewalks.

MOTOR BUSES DISCUSSED

The report of the motor bus and truck committee was presented by I. S. Fairty, solicitor Toronto Transportation Commission, in the absence of Chairman F. D. Burpee. This report will be abstracted in a future issue of ELECTRIC RAILWAY JOURNAL. Discussing the report, Mr. Fairty said that he thought the cost of transportation was a matter of no great concern to users of private motor cars. He felt, therefore, that the street car man must sell his rides on the basis of service rather than cost.

L. H. Palmer, vice-president and general manager United Railways & Electric Company of Baltimore, described the special bus trips and tours he is running in Baltimore. He stated that these trips provide a new field of revenue for street railways that have gone into the bus and coach business. In Baltimore he finds that this form of transportation is growing. On May 30, for instance, the company obtained a total revenue from this source of $2,200. Tours were run to Atlantic City, which included hotel accommodations and all ordinary expenses. Mr. Palmer expects to run regular service to Gettysburg in the near future. Tours of this sort, he feels, should make better salesmen of the electric railway men. Asked regarding competition, he said that his company bought out a competing bus company. He expects competition, and his intention is to combat it by giving better service. Mr. Harvey stated that in Toronto he is planning motor coach tours along similar lines to those being used by Mr. Palmer.

Gordon Lee, Fageol Motors Company, said that undoubtedly improvements in motor bus design can be anticipated, now that the manufacturers are studying it from an operating standpoint. He stated that a gain of 2 miles per gallon in gasoline consumption may equal as much as the cost of the vehicle during its life. He also pointed out that the total taxation of motor vehicles today is not small and that no attempt to belittle it should be made.

The speaker held as his belief that buses will either be consolidated into large operating companies or else that the operation will be absorbed by the existing railway lines. Traffic, he felt, will come from users of automobiles rather than from the present railway riders.

CARS AND CAR DESIGN

The influence of operation on car design was discussed in a paper by J. Metcalf, traffic department Toronto Transportation Commission. A companion paper on the development of the treadle exit one-man car, was read by W. R. McRae, superintendent of rolling stock Toronto Transportation Commission. Both these papers are abstracted elsewhere.

A lively discussion followed the presentation of these papers. Acton Burrows, *Canadian Railway & Marine World*, stated that he is a regular rider on the treadle cars and that he has found their operation exceedingly satisfactory. He feels that some education is necessary in order to get the passengers to use the rear door. W. R. Robertson, general superintendent Hydro-Electric Railways, Toronto, stated that he is using treadle door cars on his line with considerable success. The cost of treadles on a double-end car, he stated, was about $1,000. Mr. McRae stated that the cost of a single treadle installed was about $480, or $1,600 for the entire car.

Mr. Metcalf pointed out the difficulties with the original Birney car, due to the single door at the front for both entrance and exit. He thought that the use of the treadle is most important when the car is crowded. When but few passengers are on the car, it makes little difference whether they leave by the front or the rear. However, when there are many standing passengers in the aisle, it is more convenient for those at the rear to leave by the rear treadle door, so that its value is measured by the time saved during the rush hour, rather than by the total number of passengers who use it all day. He stated that in Toronto approximately 10,000 car-miles per day are being run with treadle cars at a schedule speed of approximately 10 m.p.h. At a rate of wages of 60 cents per hour, there is saving of some $250,000 per year on the 100 cars operated in this manner. Replying to a question as to the opportunity for passengers entering through the automatic door, he stated that only one case of this sort has been observed in Toronto.

C. L. Wilson, superintendent Hydro-Electric Railways, stated that he spent an entire afternoon trying to enter the car through the treadle door. He stated that he was able to do it only once, when a friend was getting off and where he was able to put his foot on the step before his friend had completely alighted. He thinks there is practically no chance of beating it.

There was some discussion as to the relative number of improvements in design that have been made by railway and bus manufacturers. The general opinion was that the railway manufacturers have done their full part in developing new mechanisms and practices. Mr. McRae thought that the greater number of improvements have come from the operating companies, but that the manufacturers have given full co-operation in working them out. Mr. Blair said that the manufacturers have done nobly in advising their customers and often have shown that various plans suggested were inadvisable, even though it meant a loss of business.

In reply to a question as to how the treadle door cars were backed, Mr. McRae stated that the operator remained at his post in the front of the car. There is a push button before him, which rings a bell at the rear end, giving warning to those in the path of the car that it is backing.

OFFICERS ELECTED

Following the technical discussion, the nominating committee presented a list of names for officers for the ensuing year. These were elected unanimously, as follows:

Honorary President, Julian H. Smith, president Montreal Tramways.

Honorary Vice-President, Acton Burrows, proprietor *Canadian Railway & Marine World.*

Honorary Advisory Council: T. Ahearn, Ottawa; F. A. Gaby, Toronto; D. E. Galloway, Montreal; George Kidd, Vancouver.

President, W. S. Hart, treasurer Quebec Railway, Light & Power Company and vice-president Three Rivers Traction Company.

Vice-President, W. R. Robertson, general superintendent of railways, Hydro-Electric Power Commission of Ontario, Toronto.

Treasurer, E. P. Coleman, general manager Dominion Power & Transmission Company, Hamilton.

Auditor, L. Tait, manager and vice-president London Street Railway.

Executive Committee: The president, vice-president, treasurer, immediate past-president (D. E. Blair, Montreal), and T. W. Brackenreid, Port Arthur; F. D. Burpee, Ottawa; A. H. Foster, Brantford; G. Gordon Gale, Hull; D. W. Harvey, Toronto; D. W. Houston, Regina; L. Killam, Halifax; A. W. McLimont, Winnipeg; H. E. Weyman, Levis; C. L. Wilson, Toronto.

Following the election, Mr. Hart took the chair. In a brief address he stated that the Canadian association, while small, is exceedingly active and that much good has been obtained from its meetings. The chair then called on President J. N. Shannahan of the American Electric Railway Association, who was present. In a few well chosen remarks, Mr. Shannahan summed up the present railway situation. The smallness of the Canadian association, he said, does not count. The success of the association is measured by the work done by it and its members. Mr. Shannahan extended the facilities of New York headquarters to the Canadian association. He said that he wants to make the American association more helpful to all of the sectional associations as well. Mr. Storrs, he said, is at the service of all operators and is glad to do what he can for them.

This year the usual joint luncheons of the Canadian Electrical Association of the Canadian Electric Railway Association were held, but no speeches were made. The annual banquet, held at the Windsor Hotel on June 11, was well attended. There was but one speaker, President Shannahan. After bringing greetings from the American association, Mr. Shannahan said that each year for the past ten had seemed a difficult, in fact a critical, year in the electric railway industry. "This one," he said, "is no exception."

"The particular problem of greatest concern to us at this time is in convincing our municipal authorities that we are in reality not solely electric railway people, but urban transportation people, prepared for and desirous of giving the necessary service regardless of the vehicle or the method. We are seeking to convince them that it is not only in the interest of fair play, but in their own interest to have a service in which the electric car and the bus are co-ordinated under one management, rather than seeking to destroy each other in a competitive fight, in which the inevitable end is the ruin of one, if not of both. It seems to me that the far-seeing municipality is the one which, when besought to grant a franchise to a bus company bent on a competitive fight with the existing electric railway, sends for the owner of the railway and says to him, 'We desire a bus service in certain sections of our city to supplement and extend the service you are now giving us; if you are desirous of supplying this service we will agree upon fair and equitable terms of the necessary grant.'

"It is only when a utility is earning and paying its way that it can give a continuing and permanent service. Any utility service, efficiently and honestly managed, must be permitted to earn a rate of return high enough to induce the flow of capital necessary for extensions and betterments."

Mr. Shannahan told of the formation of the advisory council of the American association and the appointment of Mr. Storrs as managing director.

The Business of Selling Rides[*]

By WALTER JACKSON
Fare and Motor Bus Consultant,
Mount Vernon, N. Y.

SELLING rides is a comparatively new business on this side the water, although the expression "Selling transportation" has been heard for a number of years. However, the usual advocate of "selling transportation" meant the promotion of business through the improvement of public relations via better equipment, safer service, polite platform men, lost and found departments, general advertising of operating data and the like. He overlooked the fact that the flat-fare system was a real barrier to the sale of the ride.

In all lines of merchandising it is a basic principle that goods be sold at a lower rate when the buyer purchases in wholesale quantities, when he purchases at slack periods, when he pays in advance and when he purchases on other than a necessity basis.

Before our industry can call itself a business it must depart from the idea that every purchaser pay the same price per ride regardless of the number bought, the time of riding or the length of the trip. Voluntary traffic—the off-peak variety that we need above all else—can come only through the differentiation of rates of fare.

DIFFERENCE BETWEEN UNECONOMIC AND PROFITABLE DIFFERENTIAL FARES

I am, of course, aware that Canada is well acquainted with certain differential fares, such as the workmen's rates. Most of these, however, are based more or less on franchise obligations. Indeed, the workmen's rates are entirely wrong in principle. In some instances, also, there have been mid-day and Sunday reductions, but it does not seem that these concessions have been actively advertised. In any event, it cannot be said that there really is such a principle prevalent as "a wholesale rate for wholesale use." A person who buys, say, five tickets at a lower rate does not have to use up these tickets within any given period.

Great Britain has had short-haul fares from the beginning of tramways, while Australia has edged over to what it calls "section" fares after starting on the American flat-fare basis in some cities.

With the British system of zone fares I wish to call attention to the principle of charging according to the length of ride; also that the zones vary greatly according to the density of traffic and the location of traffic gathering points. You may get less than a mile for your penny downtown where customers are plentiful, but possibly 2 miles at the outer end of the route where customers are scarce. That's business.

The London County Council Tramways supplement their regular and workmen's rates by a mid-day fare which combines the principles of the zone and the flat fare. Under this plan, it is possible to secure for 2d. between say 10 a.m. and 4 p.m. a ride that might cost as much as 6d. at other hours of the day. This plan, so far as personal investigation showed, has been a financial success on a number of routes for the reason that the additional riders found plenty of room on the cars. This experience proved that a transportion system that really does try to meet the fluctuations of the daily load can undertake traffic-stimulation schemes like this with more chance of financial gain than a motor-bus system which neither meets the peak-hour conditions nor has high excess capacity.

Another plan of the London County Council Tramways, inaugurated early this year, is the sale on Saturdays and Sundays of a one-day shilling pass. Pittsburgh was a couple of months ahead of London with the Sunday-holiday pass at 25 cents. This pass is the second L.C.C. plan which the bus cannot follow safely because of its lesser capacity.

---

[*] Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

London—Leader in Ride Salesmanship

London, also, has the greatest ride-selling organization in the world—the great traffic combine which is made up of most of the underground railways, the London General Omnibus Company and several suburban tramways. There the art of selling the ride from the viewpoints of differentiated fares, shorter headways, faster equipment, passenger convenience and the appeal of the printed word and colored poster has been developed to a pitch that we can hardly hope to equal.

As the posters used in London will speak for themselves, I need only add that these and other activities of Lord Ashfield's aptly-named commercial department have been the inspiration for much of our work in the United States. The lure of these posters is backed by deeds. When Albert Stanley came to London the rule was long trains at long intervals. He converted them to short trains at short intervals. Fares were on a cumulative zone basis which made them too high to foster suburban development. He encouraged modifications that shaded the fare for the steady long-haul rider by means of season tickets and thus led to still further extensions of the rapid transit routes. Train speeds were sluggish. He sought untiringly for the best in control and signal equipment. Patrons found it hard to reach the stations and irksome to wait for trains far below ground. He introduced a wonderful variety of direction signs, arranged to have the lift stay on the reassuring street level until the coming of the train was signaled and, in other instances, provided moving stairways whose worth might be studied profitably by some of our own rapid transit and suburban transit organizations.

Ride-Selling Fares in America

Under the strain of the World War, the nickel fare and the less-than-a-nickel fare went to smash. Fare increases aroused much greater hostility than the ballooning of other items. Then, too, the personal automobile came along to reduce traffic—aside from the temporary jitney. The net result was that the car ride no longer was an indispensable article to very many.

At this date it is plain that much of the hostility could have been avoided if the railways had sought a more business-like solution than a flat increase in fare. The case of San Diego, for example, shows how much wiser it was to retain the popular 5-cent rate for the short rider at least. In this instance the company's revenues were increased by more than 30 per cent without losing any customers. So, also, at New Bedford the 5-cent fare was retained in principle but was now restricted to a ride between the town center and the suburbs.

COMING MEETINGS
of
Electric Railway and Allied Associations

June 22-26—American Institute of Electrical Engineers, Saratoga Springs, N. Y.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, Lake Champlain, N. Y.

July 17-18—Mid-West Claim Agents' Association, Hotel Jefferson, St. Louis, Missouri.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

August 12—Metropolitan Section A.E.R.A., Summer Outing at Pelham Bay Park.

August 13-14—Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.

August 27-28—Operators' Section of the Iowa Electric Railway Association, Hanford Hotel, Mason City, Iowa.

Sept. 10—Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

In these installations, made immediately after the war, success was far greater and fare collection far more convenient than on the general run of properties with their 6, 7, 8 and 9-cent rates installed regardless of the length of ride. It is true that modifications in the form of ticket or token rates came along in time, but when we note one large company selling four tokens for 26 cents against a 7-cent cash fare we can appreciate that ride salesmanship and conductor-customer contacts have not received much consideration. There is something wrong with any fare system that calls for excessive change making, partly in causing waste of time and partly in emphasizing the expense of the ride.

On the Boston Elevated Railway the introduction of 5-cent short-haul fares, chiefly for the self-contained suburban towns, proved an excellent way of restoring the system to practically the same public usefulness as under the pre-war 5-cent universal fare. A few months ago these short-haul lines were raised to 6 cents, but inasmuch as the average ride on these lines is only 1½ miles it is not apparent that the change has proved fruitful.

Much credit is due to the Eastern Massachusetts Street Railway for recognition of the fact that a railway system covering an extensive urban and suburban territory cannot expect to get most revenue and most riders from a uniform fares plan. Although the casual rider pays 10 cents, the regular and semi-regular rider on some divisions enjoys as low a fare as 5 cents through the purchase of punch cards. To my mind this is a far more sensible plan than insisting that all fares should be alike throughout a large system. If there is a feeling that the local fares are higher than a self-contained policy would make them, the management must expect to stay in hot water most of the time and fail to get more revenue from more riders.

One of the most pertinent developments in short-haul fares is the 5-cent center to city boundary policy of the Public Service Railway of New Jersey. For some years following the zone fare trials, the company held fast to the old plan of a higher and higher flat fare with transfer charge regardless of length of ride. On the other hand, the jitneys which swarmed in all the Public Service towns used in most cases the simple but disastrously effective weapon of a non-transfer 5-cent fare between city center and boundary. They generously left to the railway those passengers who had to ride across town. Today the railway in absorbing the jitneys is also absorbing this fare plan to an ever-growing degree.

Lower Rates for Wholesale Users

In all of the fare plans described, and also in plans which grant some reduction for riding during the off-peak hours, there is one important omission—namely, the person who enjoys the lower rate is not necessarily a wholesale rider. It is, of course, all right to grant a reduction to any class of voluntary rider where a short-haul or off-peak condition is involved; but it is still better if such fares can be supplemented by a rate that rewards the consistent everyday patron of the service, both in lowering the cost of the ride and in making the process of fare collection more agreeable.

The latter thought is the basis of the unlimited-ride pass which is now in service in at least fifty communities. The idea of the pass was born directly from the conditions that are peculiar to the manufacture and use of mass transport mileage. During the few rush hours we have more passengers than seats—at least in one direction; and during the many non-rush hours we have more seats than passengers under any form of schedule yet devised. Some of these seats can be filled by short-haul, by mid-day, by shoppers and by theater rates; but the largest number will be filled if we can get every regular rush-hour patron to duplicate his rides for some voluntary object, as going home to lunch, going to entertainments oftener, paying more visits than before, etc.

It is sound salesmanship to make the customer forget the cost if we can. The pass reduces the spending transaction to once a week. By selling our transport in the convenient weekly package, we avoid the need of giving refunds in case the buyer finds he will not need all the purchase.

It is also sound salesmanship to make the purchaser feel that he is a bit better than somebody else. The rider with a pass does not have to stand in line for change, tickets or transfers. He flashes his badge of authority and passes on while the other riders are still at the fare box. More important than this is the privilege of boarding any car any time for any distance. He no longer rides just because he must; he also rides because he wants to.

Since the pass is intended to benefit the wholesale rider, the next question to consider is what the price should be. In general, we must get at least as much money as before, but in return we will give more of the service now going to waste. The usual price of the pass, therefore, is fifteen or sixteen times the standard rate paid by the riders who buy tokens or tickets. In exchange, it is found that the pass-holder averages 25 to 30 rides a week.

One other factor to be touched on in connection with prepaid transportation like the pass is its effect in recapturing riders from automobiles. The auto owner himself is led to look more favorably upon the trolley because he is flattered by solicitations for his patronage and because the form of rate appeals to him. The possible car rider who is carried for nothing by the auto rider is less likely to accept or wait for such free conveyance if he has been induced to buy an unlimited-ride pass.

Parking restrictions, falling off of novelty and increased gasoline charges are weaning the auto owner from using a luxury vehicle for business purposes. So there is no reason for mass transport purveyors to despair.

Quite lately, for example, I have helped to put on the pass under conditions where the cash fare was increased to 10 cents, the ticket or token rate left unaltered and the pass added. This produces three rates of fare according to the degree of patronage. Inasmuch as we do not disturb the rates paid by the regular and semi-regular riders, there can be little plausible opposition to a change in rates which really results in a lower average fare as well as greater revenue and more riders. It is clear, also, that a fare schedule free from odd coins and with almost no change making is a splendid tool for the rapid interchange of passengers on one-man cars.

Ride-Selling Fares in Pittsburgh

The remainder of Mr. Jackson's paper dealt with methods adopted in Pittsburgh in recent months for merchandising transportation. These included the extension of the transfer privilege on Sundays, the 25-cent and 40-cent Sunday passes and the weekly pass. These innovations have been described from time to time in Electric Railway Journal. The establishment of 5-cent fare zones where possible was also mentioned as a means of building public good will.

Car Designs and Their Relation to Operating Conditions*

By J. Metcalf

Traffic Department, Toronto Transportation Commission

With a view ultimately to having uniform entrance to all cars operated by the Toronto Transportation Commission, it was decided to adopt the front entrance as standard for the system. The one-man car necessarily has a front entrance. Standardization in this respect is appreciated by the car rider and assists in securing maximum speed in operation. The closeness of the entrance door to both waiting and approaching passengers, and the get-away of the car is accelerated by having entrance door under the control of the motorman as well as in close proximity to him.

When intersection operation is under police control considerable saving is possible with the front-entrance cars owing to the close co-operation that exists between traffic officers and motormen in Toronto. The traffic officer is near the center of the intersection, and consequently he can clearly see only the front door of a standing car. The traffic officer usually takes into account the readiness or otherwise of the street car to proceed, and regulates his signals accordingly. This is particularly the case in the downtown area during the evening rush hour, when the prevailing movement of passengers is outbound.

Loading and Unloading Data

An independent traffic department of the commission has made a running check on the loading and unloading times of the various types of cars operated. The figures shown in an accompanying table are the sums of the average times for five groups of passengers, that is, 82.2 (quoted in the first column in the table) is the sum of the average combined time of loading and unloading six, seven, eight, nine and ten passengers on Peter Witt cars. By dividing this sum by five we arrive at the average combined loading and unloading time of a group of from six to ten passengers.

It will be readily observed from the above that the Witt car is the speediest loading and unloading of the three two-man types of cars referred to in the table. It shows that the pay-as-you-leave cars absorb about 20 per cent more time, and the pay-as-you-enter type about 23 per cent more time.

RELATIVE LOADING AND UNLOADING TIME FOR TORONTO MOTOR CARS

Number of Passengers	Peter Witt Seconds	Peter Witt Per Cent	Pay-As-You-Leave Seconds	Pay-As-You-Leave Per Cent	Pay-As-You-Enter Seconds	Pay-As-You-Enter Per Cent
6 to 10	82.2	100	98.2	119.5	100.1	121.9
11 to 15	123.8	100	148.7	120	152.9	123.4
16 to 20	171.1	100	201.8	117.8	204.3	119.5
21 to 25	214.6	100	251.2	117	269.2	125.2
26 to 30	255.9	100	317.2	124	319.6	124.8

The following comparative figures show the loading and unloading speeds of the two and three-door trailers, of which we have 225 in service:

LOADING AND UNLOADING TIME FOR TORONTO TRAILERS

Number of Passengers	Three-Door Trailer Seconds	Three-Door Trailer Per Cent	Two-Door Trailer Seconds	Two-Door Trailer Per Cent
6 to 10	87.4	100	94.0	107.7
11 to 15	132.2	100	161.7	122.3
16 to 20	189.4	100	232.9	123.0
21 to 25	238	100	289.9	121.8
26 to 30	297.9	100	366.5	123.0

The third door in the trailer can be used for entrance or exit, as traffic warrants. Its advantages are particularly marked during hours of heavy traffic.

One-Man Cars—Double and Single Truck

The necessity and practicability of operation of one-man cars for certain routes in Toronto was decided upon after careful observation.

While cars of the Birney type, with one door at the front end for entrance and exit, have been successful, it was thought that cars with more accommodation for riders and better facilities for leaving the car would be a great improvement. The operation of a car with treadle exit, as used in Chicago, was carefully investigated; also a double-end car with rear treadle exit in Washington.

One hundred double-truck one-man cars, with front entrance and exit and rear treadle exit, have been converted from pay-as-you-enter type cars. The revised seating accommodates 51 passengers, as against 38 previous to alterations. The width of the cars permitted cross seats to be placed only on one side and the longitudinal seat on the closed side was continued around the rear vestibule. Passengers, without doubt, appreciate the cross seats, and I believe that many riders are attracted to cars fitted with this type of seat whenever a choice is possible.

With one exception, these one-man cars were put into operation on routes previously equipped with two-man cars. The cost of conversion, including full safety control and the other necessary features, is being absorbed by operating economies within eleven months where the one-man car has replaced the two-man car, the same standard of service being maintained by the one-man car. The fact that over 95 per cent of the revenue passengers in Toronto pay their fares by tickets greatly facilitates one-man operation.

The one-man cars with rear treadle exit were placed in service during November last, and at present six routes are fully equipped with this type of car. Two routes operate into the center of the city and maintain the schedule speed, with other types of cars operating partly or wholly over the same route.

Operators are successfully handling the treadle car with capacity loads, and, as they would quickly point out faults in connection with the car, the absence of any complaint from them justifies a statement that the car is satisfactory from an operator's point of view.

During the month of March a route was changed over from operation by single-truck one-man safety cars, with a seating capacity of 32, to the double-truck, front entrance and exit and rear treadle exit cars, with seating capacity of 51. The receipts of the route after the change show an increase of 14 per cent in revenue passengers and 17 per cent increase in transfer passengers. There was no alteration whatever in the schedules operated by these two types of cars.

---

*Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

LOADING AND UNLOADING SPEED

A careful study of stop-watch observations indicates that these cars handle boarding passengers slightly slower than the two-man type of car, owing to the operators of the car having the additional duties of collecting tickets, making change and issuing transfers. Speed of the one-man treadle car in handling alighting passengers exceeds that of any two-man type of car operated in Toronto. As the car is under the entire control of one man it is much more speedy at a traffic controlled intersection than a two-man type, as it is not held by the conductor or the second man in control of car doors. Stop-watch observations indicate clearly the ability of the one-man treadle car to meet schedules. It is operating in Toronto on routes where it parallels for miles cars manned by two men without interference to the running time of the latter cars, a considerable portion of the routes being through the downtown congested area. As regards safety, our records show conclusively that the operation of the treadle car is equally as safe as two-man cars on a basis of car mileage operated or on a basis of passengers carried.

All intersections are equipped with automatic electric track switches for turning the necessary points on all routes where cars operate on all-day service. While the advantages of electric switch operation are many for two-man operated cars, it would appear, from a point of efficiency, to be an absolute necessity to have automatic switches for one-man operation, especially in city service, where intersections are relatively numerous. These switches have proved very reliable. We only receive, on an average, one emergency call to a defective switch in every 81,000 switch operations.

SIX-MOTOR TWO-CAR TRAIN

Six-motor two-car trains are being converted from cars of the type formerly used as pay-as-you-enter. One experimental train has been in service since the latter part of last year. The entrance to the first car is at the front; in fact the car is identical with the pay-as-you-leave type.

The second car of the train is front entrance and exit, with rear treadle exit, and in so far as seating arrangement and general layout are concerned, is similar to the double-truck one-man cars. A movable barrier permits the conductor to use both doors at the front for exit or entrance, as required by traffic. This operation of the barrier materially assists in speeding up the loading and unloading of the car.

The first car of the train can be uncoupled and operated as a single car just as speedily as a car used for dead trailer operation, thus giving full flexibility to half of the equipment used in the making up of the train; also it is fully equipped to pull the standard dead trailer, thus rendering the car one hundred per cent flexible. This type of two-car train was finally adopted after careful consideration had been given by the management to both this combination and the articulated type of two-car trains.

The standard color of cars in Toronto is red, with cream color trim, and the appreciation expressed by the public and others interested, when cars were first painted this color, has not lessened since it was adopted. We have found that the bright car stands out distinctly. This is a great assistance in minimizing accidents.

Features of Toronto Treadle Cars*

By W. R. McRae

Rolling Stock and Shops Department, Toronto Transportation Commission

With the exception of a few double-truck, double-end cars all of the cars which have been redesigned and converted were formerly owned by the Toronto Railway and were operated by that company as pay-as-you-enter cars. These cars totaled 347.

The first lot of cars to be altered were converted to pay-as-you-leave type. The seating capacity was considerably increased by extending the closed side longitudinal seats into and around the rear vestibule. The conductor's station is located at rear end of car body on the open side in such a position as to insure full control and safe operation of the exit door. A railing has also been installed, which provides a considerable area of "prepaid" accommodation.

Part of this pay-as-you-leave group are equipped to operate as No. 1 car of the two-car trains and the others for non-trailer operation. The majority of the remainder have been altered to single-end, double-truck, one-man cars with front entrance and exit and rear treadle exit.

The realization of the management and officials that a change in design was necessary in the entrance and exit arrangement of the one-man car if its use was to be extended in Toronto led to an investigation of "treadle" operated doors and the possibility of their adoption to meet our requirements. The necessary alterations were made to a pay-as-you-enter car to permit of the installation of this door operating device. The alterations were made along the lines of the car which we inspected. [The reconstruction of this car was described in ELECTRIC RAILWAY JOURNAL for Nov. 8, 1924, page 799, and Dec. 20, 1924, page 1036.—ED.]

After the door operating mechanism was installed it was found necessary to make such alterations as would prevent any possibility of the door slamming closed in the face of an alighting passenger, which it would do if operator released the brakes, and further to permit passengers to be entirely clear of the door during the closing operation. I introduced an auxiliary valve into the system, located adjacent to the original valve puller valve, in such a manner that both valves were operated simultaneously. Air pressure was piped from the emergency line through this auxiliary valve into the valve puller cylinder, when valves were at the "door open" position. Brakes could now be released while the door was open, and it could not close while sufficient weight was on the treadle or step to keep the auxiliary valve open, but just as soon as all weight was removed, the auxiliary valve would close, and air in valve puller cylinder would exhaust, permitting spring to return puller to "door closed" position.

A demonstration showed that a practical solution had been found to overcome all of the previous difficulties and weaknesses in operation of one-man safety cars, and, further, that a one-man operated car of larger dimensions than heretofore used was practicable for moderately heavy city service. Orders were immediately placed for sufficient safety car control and treadle door operating mechanism to equip 100 cars.

A number of cars were equipped in the above manner and placed in service. They operated very satisfactorily, but it was found, however, to be rather difficult to maintain proper adjustment of the door operating and holding valves on account of variable friction losses in the mechanical method of transmitting movement from the treadle plate in platform floor to the control valves located in the door engine housing above the door. To overcome this difficulty, the manufacturers of the treadle apparatus supplied me with two electro-magnetically operated valves. These, together with the necessary resistance and a contact switch, obviated the troubles we had encountered in the mechanically-operated apparatus, and gave us as nearly a perfect door operating mechanism as it is possible to have.

It is our intention to replace the few mechanically operated treadle door mechanisms now in service with electric control as quickly as the necessary parts can be secured from the manufacturers.

Full safety control, including a line switch, is used, with the exception that the operator's foot valve has been dispensed with. The removal of this valve compels the operator to complete transactions with passengers before starting the car.

Position on Brake Valve. The brake valve has been arranged so that the ports of same come into action, starting from "release" position, in the following order: (1) Application of brakes; (2) rear exit door operative; (3) front entrance door open and rear exit door operative; (4) emergency position.

The second position, which has been added to the brake valve by a rearrangement of the ports, permits of selective operation of rear exit door. When the brake valve is at "release" position, permitting the car to move, the doors cannot be opened.

---

*Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

When the brake valve is thrown to emergency, air is exhausted from the door engines and the front entrance and rear exit doors may be opened.

Front Entrance and Exit Doors. Two double-leaf, outward-folding doors with folding steps are installed in front vestibule. The forward pair are for entrance and the other for exit. A curved rail is installed from the center of these two doors to the center of bulkhead, to separate incoming from outgoing passengers. The entrance doors are pneumatically operated, both opening and closing. The exit doors are manually operated, both closing and opening, and cannot be opened except while the entrance door is open. The exit door will close pneumatically if open when entrance door is being closed. This arrangement permits of selective door operation without the use of two door engines.

Rear Door Red Light Signal. When the rear exit door is open a circuit is established which lights a red signal lamp in front of the operator. This red light will remain lighted so long as the rear exit door is open.

Rear Treadle Step Illumination and Vehicular Signal. The opening of the rear exit door also establishes a circuit of five lamps, three in the ceiling of the rear vestibule directly over the treadle plate and step. The other two, which are red, are located on the outside of the rear vestibule under the door engine housing. These warn vehicle drivers that the rear door is open and that passengers are about to alight.

Full Treadle Operation of Rear Exit Door. The operating valves of the rear door engine have been so arranged that the closing of the front door will not cause the rear exit door to close while there is any weight upon the treadle or step.

Operation of Treadle. A passenger desiring to alight at the rear door may step on the treadle and wait until the car comes to a stop and the operator has placed the brake valve handle at the "door open" position. Then, and not until then, will the rear door open, and it will remain open so long as there is any weight on the treadle or step. When all weight has been removed from the treadle and step the door will slowly close, re-establishing the control circuit and switching off the red signals at the back of the car and in front of the operator and also the extra illumination above the treadle.

The car is equipped with the usual safety features to make the rear door inoperative, to allow the doors to be opened when the car is left unattended, and to permit operation in the event of failure of the air. In the latter event the front doors are operated by hand while the rear door is kept closed.

DOUBLE-END CARS WITH REAR TREADLE EXIT

At the present time we are completing the installation of rear treadle operated exit doors on thirteen double-truck, double-end cars. They are equipped with full safety control, similar in every respect to the equipment just described. In connection with the treadle exit doors on both ends of the car, it was our desire to reduce the operator's duties to a minimum, when changing from one end of the car to the other at terminals. To accomplish this, the electrical contacts for the treadle doors, operator's signals, rear red light, treadle signals and Nichols-Lintern red and green light circuits are interlocked in the controller, so that when controller handles are changed to the other controller, all circuits are automatically made to suit the direction of car movement.

The first or lead car of this combination is similar in layout and operation to the pay-as-you-leave type which are equipped to haul trailer cars, and the similar type used for non-trailer operation. They are, however, equipped with an auxiliary set of resistances, extra electric contacts on automatic couplers, a line switch and a specially designed drum switch. This latter switch must necessarily be operated when making up or breaking trains. The drum switch, in addition to controlling compressed air lines and the electrical circuits between the two cars of the train, also takes care of shunting in and out of service the auxiliary resistance of the No. 1 car. The electrical connections in the coupler head of this type of car are arranged so that they can be coupled to and operate a standard trail car. All doors of the train are interlocked with the control circuit.

The second car of the six-motor train is designed for front entrance and exit and also rear exit by treadle operated door and step located in the rear vestibule. This car is equipped with two motors of similar type and gear ratio to those used in the first car of train. Both motors are installed in the forward truck. Also a trolley pole, circuit breaker, reverser switch and resistor unit are included in the equipment. When coupled to the leading car the trolley pole is hooked down to the roof, the circuit breaker opened and the reverser switch set in forward position. When it is desired to move this type of car in yards or buildings, or to make up trains, the trolley pole is placed on the wire, the reverser switch, which has a removable handle, is set in the desired direction of movement, and by means of the circuit breaker and powered hand brake, well controlled and safe movement is secured.

Control of both front doors and the rear treadle operated exit door is located at the conductor's station. The front doors are equipped with a pneumatic door engine, operated in the usual way by lever and rod to engine valve. The rear treadle exit door is operated by a switch of the push button type, which, when in position for train movement, closes the train control circuit and opens the circuit through which passes current to one of the electro-magnetic valves of the rear treadle exit door engine making it inoperative while the train moves.

When the train is at rest, and it is desired to have the rear exit door become operative, the door control switch is thrown to rear door operating position. This movement opens the train control circuit and connects the circuit to the treadle valves and switch. The depression of the treadle completes the circuit and the exit door will open.

Should the conductor inadvertently or prematurely reverse this switch, the rear exit door will not close in the face of alighting passengers while there is weight on the treadle or step. Due to train control interlock, the train cannot be started until the doors are all closed; therefore, the train cannot be moved until all the doors are closed and proper circuits established. Red signal lights, located in front of the motorman of the train and the conductor of the second car, are lighted while rear treadle door of second car is open. The standard signals between motorman and conductor of second car, as used in all trail cars, are installed in the second car of the train.

New York State Convention

PLANS for the 43d annual meeting of the New York Electric Railway Association are virtually complete. The meeting will be held at Hotel Champlain, Bluff Point, N. Y., on June 26 and 27. Following is the program of the technical papers to be presented on Friday, June 26, beginning at 10 a.m.:

"Some Comment on the Electric Railway Industry," by Lucius S. Storrs, managing director American Electric Railway Association.

"Electric Railway Equipment Maintenance and Shop Practice," by L. J. Davis, assistant to general manager Brooklyn City Railroad.

"Why Doesn't New York Speak for Itself?" by Labert St. Clair, director of advertising American Electric Railway Association.

"What Can Be Accomplished by a State Information Committee," by J. S. S. Richardson, director of the Pennsylvania and New Jersey Committees on Public Utility Information.

"Is Educational Work Worth While?" by Edward Dana, general manager Boston Elevated Railway.

"The Investigation and the Trial or Settlement of Accident Cases," by W. Harry Sefton, assistant counsel Brooklyn-Manhatton Transit Corporation.

"The Articulated Car," by W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Corporation.

"Track Economies Through Welding," by R. B. Fehr, development engineer Rail Welding & Bonding Company.

There will be two speakers at the dinner Friday evening. One will be William L. Ransom, general counsel Consolidated Gas Company, New York, and formerly chief counsel Public Service Commission of New York, who will speak on "Utility Management Under State Regulation." There will also be a talk on topics of the day by Dr. E. J. Cattell of Philadelphia.

Special Pullman cars will be attached to New York Central train No. 29, leaving New York on June 25 at 8 p.m. Eastern standard time. The cars will be detached from the train at Bluff Point, so that it will not be necessary to leave them immediately upon arrival. One sleeper will return to New York, leaving Bluff Point on June 27, and the remainder on June 28. Applications for Pullman accommodations, together with transportation, should be made to Carl Beck, 150 Broadway, New York City.

The entertainment committee is preparing a program which will include sightseeing trips, bridge tournaments, dancing, etc. There will be a sweepstakes handicap golf tournament. Handicaps should be sent to T. R. Langan, chairman entertainment committee, 150 Broadway, New York City.

Hotel reservations can be made through J. P. Greaves, 2 West 45th Street, New York City.

Mid-West Claim Agents to Meet in St. Louis

ST. LOUIS, MO., will be the scene of the fifth annual convention of the Mid-West Claim Agents Association, which will be held at the Hotel Jefferson on July 17 and 18. In addition to the address of President Trevor Neilson and reports of officers, a number of papers will be presented.

An address of welcome by Mayor Victor J. Miller of St. Louis will open the Friday session at 10 a.m. Dr. T. V. Boyd will discuss "The Relation Between the Public and the Company from a Company Surgeon's Point of View." Charles B. Hardin will speak on "What Methods Does the Claims Department Follow in Preparing Cases for Trial?"

At the afternoon session on July 17, beginning at 2 o'clock, papers will be presented by Dr. Henry J. Scherck on "Perjury for Pay"; by Walter E. Robinson on "To What Extent Does Your Legal Department Enter into the Settlement of Either Claims or Litigated Cases"; by R. S. Mahan on "Practical Prevention of Accidents"; by D. L. Fennell on "Co-operation Between Operating Department and Claim Department."

The Saturday morning session will begin at 9 o'clock. At this session papers will be read by D. M. Finch on "The Bonus Plan in Effect in Des Moines"; by C. B. Proctor on "Results of Collective Bonus System"; by H. F. Burnie on "Motorbus Operation from a Claim Agent's Point of View"; by S. G. Shaw on "What Effect Has the Automobile Had in Lowering the Caliber of Witnesses Secured by the Platform Men"; by Warren Swisher on "Should Pedestrians Be Permitted by Law to Halt Vehicles at Street Crossings."

Following the presentation of papers, there will be the annual election of officers and general business of the association.

Increasing Passenger Traffic by Advertising*

By Frank L. Blanchard
Director of Public Relations
Henry L. Doherty & Company, New York

EVERY street or interurban electric railway company should have a well-defined advertising policy. Its annual budget should contain an appropriation to cover the estimated cost of the publicity for the ensuing year. This, of course, cannot be determined until after a thorough canvass of its advertising needs has been made.

There are two kinds of advertising that should be regularly carried on by a live railway company intent upon getting the most out of its territory. Institutional advertising is employed to create public good will. It consists of attractively prepared advertisements setting forth important facts about the company, its organization and personnel, the service it renders the community and its achievements. Such advertising is wholly educational in character, its purpose being to interest the public in the enterprise as a home town institution and thus build good will for it.

The second kind of advertising street railways must undertake, and by many operators considered of greater importance than institutional advertising, is business-getting publicity. It takes an entirely different kind of copy to induce people to become riders in our cars. Business-producing advertising deals with the character of the service the company is furnishing the public; points out the advantages of street cars over other forms of transportation available in cities; gives a list of the parks, resorts and other places of interest that may be reached by the company's lines; tells how open-air car riding contributes to good health; how much safer the cars are for children going to school than walking on the sidewalks where they must cross many streets; how much time can be saved in the larger cities by women when out shopping.

I think you will agree with me that one of our most important tasks is to induce the owners of automobiles to use the street cars instead of their motor cars in going to and from their places of business.

The question that we as street railway men want answered is this: "How can we convert automobile riders into car riders?" One thing we can do is to secure a list of automobile owners in our territory and plan a direct mail advertising campaign that will place before them facts and arguments that will convince them that while automobiles are a great convenience and comfort, they are inconvenient and inappropriate for use in congested city territory. The letters, booklets or folders used in such a campaign should be prepared with great skill. All statements made concerning automobile riding should be conservative, in order not to offend or antagonize those who own motor cars.

I take it for granted that you are all regular advertisers in the newspapers. While your direct mail campaign is on, one of your newspaper ads each week should also be devoted to the conversion of automobile riders into street car riders. These two advertising forces working together will be found mighty effective in increasing the volume of passenger traffic, not only in winter when many automobile owners lay up their cars but also during the summer when inducements to take to the road are so numerous.

In those cities where bus companies compete with the street railway the latter will find advertising an important factor in maintaining or in building up its traffic load. For short hauls the street cars have so many advantages over the buses that there should be no difficulty in convincing a large part of the public that the street cars furnish the best service.

"What are some of these advantages?" you may ask. First there is the roadbed. Street cars travel on a smooth, level track while buses proceed over pavement or other surface that is often rough and uneven. Moreover, street cars are roomy, commodious and well ventilated. Buses are, of necessity, smaller, the seating facilities are cramped and the ventilation in winter is poor.

But, someone will say, all these things are known to everybody: therefore, why spend money in advertising them to the public? As a matter of fact, they are not known to everybody. Because you know them is no proof that any considerable part of the community knows them. Human nature is such that people are ignorant of many things that they see every day and yet do not observe. If we have a business message we desire to lay before them we must put it in the simplest and most attractive form and then repeat it over and over again until finally it registers in their brains.

In our street railway advertising we must keep this fact constantly in mind. We must make our announcements so readable and interesting that people will want to look at them. There are many persons in the world who do not appreciate the advantages they enjoy until someone comes along and tells them what they are. Street cars are such familiar objects that we overlook the ways in which they contribute to our comfort and make our lives pleasanter.

A new factor in the street railway and other public utility businesses that will greatly stabilize and promote our industry is customer ownership. All advertising is not confined to the newspapers, the magazines and the billboards. Word of mouth advertising is, so far as its limitations allow, the best kind of advertising. Every man or woman who purchases a share of stock in your company becomes a booster for the road and a protector of its interests.

The larger the number of passenger owners of our securities the greater will our transportation traffic load become. Because they have a stock or bond interest in the company they will do what they can to increase its business while they themselves will be among its most constant patrons. They become untiring advertisers of the road, working without pay. They defend it when unjustly attacked by its enemies. They oppose hostile legislation either by city or state, and they often make suggestions that are worth thousands of dollars to the company.

Some of you property managers occasionally have trouble in securing a renewal of your franchise. Opposition, political or social, develops. Perhaps a self-appointed reformer attacks the company or a hold-up politician makes a few remarks that might be construed as a veiled threat of trouble in case certain persons were not seen before the vote on the franchise was taken. When such a situation arises there are two legitimate ways of handling it. One is to marshal to your support as many of the city officials, substantial business and professional men, and passenger owners of your securities as possible. The other is to present to the public through a series of well thought out advertisements published in the newspapers such arguments and data as will convince the public that the franchise should be renewed, and that this should be done not so much for the benefit of the company as for the benefit of the community itself.

---

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

Getting the Community with You[*]

By Thomas Fitzgerald

Vice-President Pittsburgh Railways

In 1919, about a year after the Pittsburgh Railways went into receivership, there came to Pittsburgh a steam railroader, A. W. Thompson, to take the presidency of the Philadelphia Company and affiliated companies, including the Pittsburgh Railways, Duquesne Light, Equitable Gas and other companies. He insisted upon the policy of making every possible effort to conduct the railway as nearly as possible in accordance with the wishes of the public. In other words, actually to put service first in everything, to insist upon only those things which are necessary to good service, and to depend upon the results of this policy for financial rewards over and above the money absolutely necessary for the maintenance of service.

The truth of Lincoln's words "with public sentiment nothing can fail, and against public sentiment nothing can succeed" was recognized by the management, so it set out deliberately to find out what public sentiment actually is regarding its activities and to do its best to conduct itself accordingly. Every effort is made to get full information regarding the affairs of the railway to the public in order that the sentiment may be as nearly as possible based on facts.

The first step in following out this policy was to enter into a new agreement with the city of Pittsburgh. The negotiations lasted over two years, during which time every effort was made to give fullest publicity. Finally, on Dec. 20, 1921, the agreement under which the railway is now operating was passed unanimously by the City Council and approved not only by the Mayor but by the Mayor-elect.[†]

The agreement is in effect a service at cost arrangement which seemed to suit the Pittsburgh siutation better than any other method of co-operation. It has the usual weakness of service at cost contracts in that it contains no definite reward for efforts to improve service and to increase the usefulness of the system to the public. This is theoretically cared for by a clause which provides for a distribution of surplus to the company amounting to one-half of any economies effected, after all debts are paid. The prospect of gaining any such reward during the term of the contract, which is ten years, seems, however, very remote.

A usual defect in other service-at-cost contracts has resulted in the inability of the companies to finance improvements and extensions. This has been overcome in this instance by the provision that the Pittsburgh Railways may earn the cost of new money in addition to the fixed return referred to above.

Looking back over the sixteen months that have elapsed since the return of the property, the most important factor in the prosecution of the management's plan seems to be the fact that the returns to security holders are fixed by the contract. With the complete publicity provided, the myth of fabulous fortunes diverted from service improvements has been properly executed and buried, at least for ten years. It is to be hoped at the end of ten years that this spirit will remain buried and that the spirit of co-operation and reward for effective effort will be very much alive.

On this idea of a reasonable fixed return to the company has been built a program of publicity for the information of the public. The principal feature has been the insistence upon the fact that unfair charges and license fees are reflected primarily in increased fares and impaired service. Under the contract the company's limited return is practically assured unless the public wishes to dismember the property and split it up into a number of smaller independent systems. This latter, it is pointed out, would be a tremendous blow to the community in its most vital functions.

Following this, the fact is stressed that for all practical purposes the railway system is a public institution, regulated, although not managed, by the city authorities. For the car rider the company acts as a kind of trustee, taking his money, paying wages, operating expenses, taxes and interest on the money invested and applying anything over this to improvements or to reducing fares, all of the time managing the property to the best of its ability, and when any question of public interest comes up the company gives its best advice, accepts the decision of the public and loyally tries to carry out that decision. It is frankly stated by company representatives in public meetings that its policy is based on the opinion that the car rider is more interested in improved service than he is in reduced fares. So far, in many meetings during the last year, this statement has not been publicly contradicted by any one, although of course many requests for reduced fares have been made.

The present policy is based on the idea that as public opinion changes the policy will undoubtedly be changed accordingly. If the public insists upon reduced service and reduced fares this will undoubtedly be the policy. It is hoped that as time goes on the public will realize that its interests will be best served by the best possible service at the lowest possible rates gained through a good reward for effective effort. Until this sentiment has been gained, the policy is to accept what can be decently earned and give the best possible service for that. In other words, it is believed that the reward will follow the effort. Instances where effort has been rewarded can be pointed out. On the other hand, instances where effort has apparently been penalized can also be cited. If only the successful cases are considered, one can become a Pollyanna. If only the failures are considered, one can become a confirmed pessimist. Whether or not real progress can be made through such a policy is largely a matter of personal opinion or belief. Undoubtedly the overwhelming opinion of the Pittsburgh Railways officials and a large majority of the other employees is that such a policy has been and will be successful.

In addition to the contract as a basis on which to arouse public interest in street railway affairs, it was thought necessary to find some tangible way in which to convince the public that the management was actually doing something, no matter how small, to favor it. A large number of additional transfer privileges have been established. Some short lines have had fares reduced from 8⅓ cents to 5 cents. The same reduction in fare has been made on the outer ends of some long lines. In Washington, Pa., where a 6-cent fare was in effect, a 95-cent weekly pass was established. Recently the fare was reduced to 5 cents and the weekly pass to 75 cents, with no apparent loss in revenue.

Another important change in fares was the Sunday and holiday pass. On account of the predominant effect of weather conditions on Sunday and holiday traffic, it is very difficult to estimate the financial benefit that has resulted. There is no question, however, that Sundays were falling below previous years at a much greater ratio than weekdays. After the pass was inaugurated they more than held their own and, under similar weather conditions, are going ahead of previous years.

The last and most important fare adjustment intended to gain public support is the $1.50 weekly pass, the use of which started on June 1. The hope behind the pass is that by its use the transportation service will become so useful to the people of the community that they will permit the management to gain some reward commensurate with this usefulness.

It is believed that the attitude of the public and the men has been influenced greatly by these evident efforts to make the service more useful. There have been some outstanding bits of evidence confirming this idea. One was the successful introduction of one-man car operation. In the installation of one-man cars the service was improved. In some cases, large double-truck cars replaced small single-truck ones, car for car, thus providing an increase in the number of seats. Where large double-truck cars were already in service more frequent service was installed.

The operation of multiple-unit trains on heavy grade lines carrying dense traffic has been inaugurated, in place of motor car and dead trailer trains. This was appreciated by the car rider on account of the smoother acceleration, especially of the trail car. The dead trailers on the heavy grade lines were most uncomfortable on account of inevitable slack in the couplers, causing severe jerks when starting. In addition to the multiple-unit trains, the six-motor train, developed by a previous management, is being installed on lines where traffic and grades do not require multiple-unit equipment.

---

[*] Abstract of a paper presented at a meeting of the Central Electric Railway Association, French Lick, Ind., June 2-4.

[†] A summary of the principal features of this agreement was published in ELECTRIC RAILWAY JOURNAL, May 23, 1925.

One insignificant change in practice resulted in a surprising amount of favorable comment. This was the change in the color of cars from a deep Tuscan red to a medium bright orange color. The red was not a brilliant color and the change to the bright orange was very striking, especially in the narrow streets of Pittsburgh on a gloomy day.

So far as the management was concerned, the most important new thing that was done was the establishment of a commercial department, corresponding to the sales department of an industrial organization. This department is in charge of a manager with full responsibility for public relations, amount and kind of service and rates of fare. It is the principal point of contact between the public and the management and is free from the responsibilities for operations which rest upon the general manager. It is hoped and believed that in this way a more sympathetic attitude toward the public may be acquired and at the same time responsibility for earnings to pay for the quality of service specified by the department will prevent the giving of more service than justified.

In addition to the commercial department a new department of research was organized whose responsibility it is to keep the management from getting into a rut. This department is responsible for our relations with other companies, especially to see that any information other companies may want is made available to them. Primarily, however, its responsibility is to see that the management is kept informed of any new developments affecting the business and to investigate and report on subjects of interest. Statistical information naturally is compiled in this department. The relief which this department affords the executive, commercial and operating departments from investigations and reports which frequently clog up the whole machinery of management is tremendous.

The history of the railway's attempt to improve service on lines operating to the central district may serve as an example of the working out of the policy of adapting company activities to public opinion and suggests an answer to the question as to whether or not such a policy offers good prospects of favorable results. As a palliative only for the congested condition of traffic in the downtown district the railway proposed to turn its long lines short of the congested area.‡ Opposition arose, however, on the part of the downtown merchants and the Real Estate Board. They appealed to the Public Service Commission and the Court for a restraining order. When it seemed evident that neither the Public Service Commission nor the court would do anything to interfere with the plans and the business men suggested an additional track on a street into the business district which would better distribute the railway operations and remove a large number of cars from the point of greatest congestion, short looping of other lines was agreed to, bringing about a great relief from present conditions. Another result was an ordinance restricting parking, which has made a tremendous improvement in service.

What results have been secured? To answer such a question is simply to express an opinion. On Feb. 1, 1924, the United States court which had held the property in receivership for six years practically said that the company was still insolvent, but its property would be returned to it subject to the protection of the court until Dec. 1, 1924. At the end of December the company was able to report that the property had paid all of its current expenses, including charges on an additional $5,000,000 new capital and the more than $330,000 annual payments to be paid to municipalities if earned. A very meager sum also appeared on the right side of the ledger as a surplus from the year's operations. The court did not deem it necessary to continue its protection. It is now five months later, and with the benefits from the improvement derived from the $5,000,000 beginning to accrue it is hoped to show black figures again this year in spite of a very severe slump in business.

---

‡Details of this plan and of the one which eventually was adopted were published in ELECTRIC RAILWAY JOURNAL, May 30, 1925.

Co-ordination of Transportation Proposed in Scotland

COMPETITION of buses with tramways was discussed at the annual conference of the Scottish Tramways Association, held at Ayr recently. One suggestion came from H. C. Babb, engineer and manager of the Musselburgh Tramways Company. Considering a remedy for the transport problem, he suggested that there was an example in the joint electricity authorities constituted by the Electricity Commissioners under the powers conferred on them by the electricity supply acts. As the country was being divided by the commissioners into electricity supply areas, so it should be divided into transport areas and an authority formed in each with full control of transport services in the area. The bus interests should be represented on the transport authority. With such a body operating, wasteful overlapping would be avoided.

American Association News

Entertainment

PLANS for the entertainment features at the October convention of the American Electric Railway Association were considered at a meeting of the entertainment committee held at association headquarters, New York, on June 15. Those present were S. J. Cotsworth, chairman; Mr. Riley representing G. A. Barnes; C. H. Beck, H. L. Brown, F. A. Elmquist, E. C. Faber, C. E. Hale, J. W. Hancock, L. H. Palmer, S. L. Poorman, W. J. Stanton, J. W. Welsh, F. C. J. Dell and Morris Buck.

Features planned for Sunday include a golf tournament during the day and a sacred concert at the Marlborough-Blenheim in the evening. Monday will be devoted to registration. A reception to the president and officers is to be held that evening at 9 o'clock. A card party is planned for Tuesday afternoon for the ladies.

For Tuesday evening a general meeting of the association under the auspices of the advisory council is planned. The principal address will be given by some speaker of national prominence. The Coffin prize is to be awarded at this meeting. Following the evening meeting there is to be a dance. On Wednesday evening, a special entertainment is to be held. This will be entirely different from the entertainments given in the last few years. For Thursday afternoon a golf tournament for ladies is planned at the Sea View Golf Club. The grand ball will be held in the ballroom on the Pier on Thursday evening.

Chairman Stanton of the golf committee was authorized to arrange both the Sunday tournament for men and the Thursday tournament for ladies, and to provide suitable prizes. Mr. Cotsworth will have charge of the music for the sacred concert and for the ladies' entertainment. Messrs. Palmer, Stanton, Beck and Brown were appointed a committee to investigate the subject of dance music and to obtain suitable bands. For the Monday evening reception, Harry Reid was appointed chairman. George Barnes was appointed chairman of the sub-committee on ladies' entertainment. Messrs. Palmer and Faber were appointed a committee to secure propositions from high-class concert singers and were instructed to report back to the committee. Mr. Brown will have charge of the Tuesday afternoon ladies' performance and will also provide ushers for the evening meeting. Carl Beck was appointed chairman of the committee on the Wednesday evening entertainment. Mr. Faber will be in charge of arrangements for the Thursday evening ball.

It was decided that the association should have a representative at the gate for all evening entertainments. Mr. Elmquist was appointed chairman of a committee to represent the association, so that only persons with the proper credentials would be admitted to the pier.

A resolution was adopted that the pier be reserved for a dance on Tuesday evening following the evening meeting of the association. In this connection, it was pointed out by Mr.

Dell that the contract with the Pier management necessitates that every one be off the pier by 12:30 a.m.

Several plans were discussed for the Wednesday evening entertainment. It was proposed that the Hippodrome be used. Mr. Dell pointed out that in the event of cold or windy weather this auditorium would be exceedingly uncomfortable to the audience, so that arrangements should be made to transfer any entertainment to the ballroom in the event of bad weather.

A motion was passed that the executive committee of the association be requested to appropriate a total of $6,000 for entertainment. A sub-committee on publicity was appointed consisting of Messrs. Buck, Kenfield and Colton. A sub-committee to co-operate with the exhibit committee consisting of Messrs. Brown and Hancock was also appointed. It was decided to hold the next meeting early in September.

Power Transmission and Distribution

When the power transmission and distribution committee of the Engineering Association met in New York on June 11 and 12 reports of the various sub-committees were received and adopted. The report of the main committee will be very interesting and useful, as many matters under discussion are presented in final form.

A complete review of the text book matter in the Manual has been brought in by the concrete pole sub-committee. This will give co-ordinated data which will enable an engineer to design such poles for definite service requirements.

The sub-committee on catenary construction brought forward a compendium of experience which will give valuable information regarding modern catenary construction methods. It also contains examples of recommended practice.

The whole question of signal aspects for continuous track circuit signals as well as trolley contact signals has been reviewed and rewritten. In the finished report, the complete operation of running a train through the various types of blocks will be worked out. Specifications of hard-drawn trolley wire and high-strength alloyed trolley wire have been completed. In almost all points they are in accordance with the A. S. T. M. specifications. A review of causes of breaks in trolley wire with an analysis of the tabulated results is being completed and will be accompanied by charts, showing relative sources of causes of such breaks.

A section has been prepared for the manual on temporary trolley contacts, by the use of which it is hoped to eliminate damage being done to the trolley wire by the use of ordinary wire hooks, etc. The present trend of construction on trackless trolley systems has been followed up and a recommended practice report has been brought in.

The sub-committee on return circuits has classified the methods in use by systems under comparable conditions and has drawn several conclusions as a guide to future bonding methods.

Radio interference has been investigated. An instructive report, along with experimental tests and a great deal of miscellaneous information, is being prepared.

The "Preese" test for galvanizing came in for much discussion. Although admittedly not entirely satisfactory, it was decided not to recommend its immediate removal from the manual. Attention should be drawn to its unreliability in certain cases. It was felt that the whole question of a proper test should be settled at an early date.

Members present were: J. Walter Allen, J. H. Drew, Charles Gilman, H. W. Griffin, C. J. Hixson, C. D. Hancock, M. W. Cooke, F. McVittie, H. S. Murphy, J. F. Neild, W. J. Quinn, W. Schaake, J. M. Waldron, F. J. White, W. E. Huber, Adrian Hughes, Jr., W. H. Bassett, Jr., G. D. Radburn, Mr. Bailey, Mr. Arms, M. B. Rosevear, sponsor; C. H. Jones, chairman.

Purchases and Stores

Present at the meeting of the joint committee on purchases and stores of the Engineering Association and stores accounting of the Accountants Association, held in New York on June 15, were for the Engineering Association: A. A. Ordway, J. Y. Bayliss, J. Fleming, F. A. Jordan, P. F. McCall and A. E. Hatton; for the Accountants Association: R. A. Weston and T. E. Wilkin.

Due to the untimely death of Chairman H. H. Lloyd, the first business was the election of a chairman. Mr. Ordway was elected as chairman pro tem. It was decided to choose an acting chairman for the remainder of the year. Mr. McCall was elected to the position.

Attention was devoted by the committee to a review of the various subjects for inclusion in the annual report. A proposed report by C. A. Harris on a centralized system of stores was presented for discussion. It was brought out that two separate and distinct considerations were involved: (a) Physical centralization of materials; (b) centralized control of stocks. Centralized control, it was considered, was desirable and economical.

Methods of handling freight and express bills were considered. It was agreed by the committee that this subject could not be completed during the current year. Accordingly it was recommended that it be assigned as a subject for next year's committee.

Mr. Fleming submitted for consideration a number of purchasing department forms. These included two forms of purchase requisitions, two forms of requests for quotations, purchase order, and a material received report. After some discussion a selection from the forms submitted was made for inclusion in the report.

At the beginning of the second day's session, suitable resolutions were adopted on the death of Mr. Lloyd.

The national standard invoice form prepared under the sponsorship of the National Association of Purchasing Agents was indorsed and it was recommended to the executive committee for action. A report prepared by Mr. Ordway setting forth the advantages of centralized storekeeping was adopted, with the recommendation that the subject be discontinued. Routine methods to be followed in the purchases and stores department was recommended for continuation as a subject for next year. A number of other subjects were discussed for inclusion in next year's program.

Some consideration was given to the program for the October convention. It was the sentiment of the committee that one afternoon should be devoted to a meeting of purchasing agents and storekeepers, the same as for the last two years. Suitable subjects for discussion on the convention floor were taken up, but no definite decision was reached.

Welded Rail Joint Committee Progress Report

Copies of the third progressive report of the committee on welded rail joints were distributed to all members of the American Electric Railway Association early in June. Additional copies of the report are available at association headquarters at cost, $1.50. It also was reprinted by the American Welding Society in the May issue of its journal. Copies may be obtained from William Spraragen, secretary American Bureau of Welding, 33 West 39th Street, New York City.

This report makes an attractive and well-illustrated pamphlet of 136 pages. The contents is varied and includes, among others, the following items:

Tensile Tests—The tensile tests are reported in diagrammatic form for 64 different joints, including apex joints, Lorain bar joints, Lorain butt joints, cast weld joints, thermit joints and ten different varieties of seam-welded joints. Extensometer readings show the action under test of the head, lip and each side of the base of the rails.

Bend, Drop and Impact Tests—Forty joints are reported on in the above three types of tests, including for comparison, drop test made on unbroken rail. A description of the repeated impact testing machine designed by the committee and now in use at the Bureau of Standards is included.

Examination of Tested Joints—The report includes a detailed description of the method of failure of a large number of joints, in addition to illustrations showing the full size joints. Two metallographic reports are included—one by the United States Bureau of Standards and one by the Union Carbide and Carbon Research Laboratories.

Program of Future Investigations—The first three progress reports have dealt with the present state of the art of making welded joints. This investigation is substantially completed. The committee's program for future investigations looking toward improvements and developments in making welded joints is given in detail in the report and covers the work that will be done during the next twelve months or so.

Miscellaneous Data—In addition to the above the report contains brief references to the rotary service testing machine which it was intended to develop; also to telemeter and otheograph tests. It describes a new type of contact pyrometer developed by the United States Bureau of Standards. It also contains reports and comments on preheating and postheating investigations.

The News of the Industry

Fare Decision Significant

Belt Line Decision of United States Supreme Court Emphasizes Right to Reasonable Fare

Much interest attaches to the decision of the United States Supreme Court on May 25 in favor of the Belt Line Railway Corporation, New York, referred to briefly in the ELECTRIC RAILWAY JOURNAL for May 30, page 862. The parties on the other side in the suit were the District Attorney of the County of New York, the State of New York and the State Transit Commission. The full decision of the Supreme Court, received since the previous article was published, brings out a number of additional interesting points.

After reciting the history of the case, the decision declares that the company was justified in appealing to the federal court for an injunction from the ruling of the commission that it should make a joint fare of 5 cents with other companies in New York. While the commission began in 1920 to hear evidence whether the rate should not be increased to 7 cents, the company was not bound to await final action by the commission and in the meantime to serve without just compensation, if the rate was confiscatory.

The lines of the Belt Line company are controlled through stock ownership by the Third Avenue Railway, New York, and in its plea the company did not ask to be relieved from a joint fare with these lines, but with the other railways of the city, with which it had no corporate connection. The Supreme Court declared that this request for relief for some through routes and not for others was within the rights of the company, and the question of whether the business of the Third Avenue Railway was to be benefited was not involved in the suit. The court found nothing in the charter of the company or the laws under which it was organized that imposed any obligation to carry passengers for fare proposed.

The contention of the city was that additional traffic on this joint route would not be carried at a loss when considered in connection with the additional expense involved in carrying it, but the Supreme Court declares this to be an unjust method of determining the cost. It says that while a carrier has no constitutional right to the same rate or percentage of return on all its business, the state may not select any class of traffic for arbitrary control and regulation. The management and the right to control the business policy of the company belong to its owners. In this portion of the decision, the Supreme Court declares that "the mere fact that a rate is not confiscatory does not indicate that it must be deemed to be just and reasonable."

The Supreme Court did not attempt to determine the valuation of the property, but after considering the indebtedness of the company and the valuation made by an engineer who had been employed by the commission to make a valuation of all the street railroads in the city it decided that the resumption of the transfer business in question would require additional operating expenses in amount in excess of the resulting increase in revenue, and that the rate proposed was confiscatory.

Permit for St. Louis-Kansas City Line Refused

The Missouri Public Service Commission has made an order denying the application of the St. Louis-Kansas City Short Line Railroad for a certificate of convenience and necessity to construct and operate a double-track electric interurban line from St. Louis to Kansas City. The commission held that in view of the magnitude of the proposed undertaking and its importance to the public the company should be entitled any time within one year to have a further hearing to prove its financial ability to pay the cost of constructing and operating the proposed line. It has failed so far to show this to the satisfaction of members of the commission, the order stated.

Evidence produced at the several hearings held on the application was that it would require from $30,000,000 to $40,000,000 to construct the line and acquire right-of-way, while an additional $20,000,000 would be needed for equipment. The promoters said that they had expended some $260,000 in preliminary work on the line and had secured right-of-way over nearly the entire route.

Several steam railroads contended that present rail facilities between the two cities were adequate. The commission ruled that the fact that the road would compete with existing steam roads was not in itself sufficient to warrant refusal to issue the permit, but that more evidence must be presented of the company's financial ability to construct the railroad.

Insulls After Illinois Line

The Insull interests of Chicago are negotiating for the purchase of the Chicago, Peoria & St. Louis Railway between Pekin and Springfield, Ill. They will rebuild it and electrify it. For months a patrons' committee has been active in securing a 200-ft. right-of-way along the route, the principal condition upon which the Insulls agreed to take over the transportation line. The road, if purchased, will be combined with the Chicago & Illinois Midland and will reopen many Illinois coal mines closed or curtailed in production because of lack of shipping facilities.

Ten Cents Cash

Omaha Hopes to Make Ends Meet Under New Fare Allowed by State Commission

Ten-cent cash fares are being charged by the Omaha & Council Bluffs Street Railway, Omaha, Neb. The State Railway Commission on June 10 granted the company an increase in fare to bring annually between $311,000 and $367,000 more revenue. The company accepted the increase and put the new rate in effect at once.

Patrons pay a 10-cent cash fare or buy six tokens for 40 cents. This is an increase of 3 cents in the cash fare and five-twelfths of a cent in the token fare. School tickets are abolished. The fare schedule follows: Adult cash fare, 10 cents. Adult tickets, six for 40 cents. Children's cash fare 5 cents (tickets, ten for 35 cents), from ages of five to twelve years. These formerly were 3 cents each. School tickets, abolished; they formerly sold at 5 cents.

R. A. Leussler, vice-president and general manager, also promises supplemental bus service at an early date. He made a statement in part as follows:

> The rates of fare fixed by the State Railway Commission will not, in our opinion, yield the increase in net income to which the commission states the company is entitled. Much depends upon the volume of traffic and the trend of price level of the items going into operating expense. If the travel on street cars should continue to decrease at the same rate as it has for a year past then the rates will fall considerably short of producing the revenue intended.
>
> If, on the other hand, travel should increase, as we earnestly hope it may, then the rates will perhaps yield a sufficient amount of revenue. The railway has ever been anxious to do its part in furthering the prosperity and best interests of the communities it serves. In line with that policy it did not press its right to an increased fare at the time of the valuation. In line with that policy, too, the company will make every endeavor to make the rates just fixed prove sufficient. To that end it will seek to increase travel and will at the earliest date possible start bus service to supplement its street car service. This bus service will necessarily be limited at first, but if it proves satisfactory the company will add to it from time to time as results justify.

In its opinion the commission holds, that if operating costs continue at the same favorable level the rest of the year that they have held the first five months, the company will receive a return of 7 per cent on the valuation of $14,100,000. In its application, the company sought an increase of $400,000 a year in revenue and made a claim for amortization of losses for five years back. The commission holds that as the company in 1923 withheld a request for an increase, it is a party to previous losses and cannot now ask to have them made up.

Depreciation set up and additions and betterments practically offset each other, say the commissioners.

International Eight-Cent Appeal

The appeal of the International Railway, Buffalo, from the decision of the Public Service Commission for reconsideration of the 8-cent fare award on the local lines of the company was scheduled to be heard June 18 at Buffalo. In appealing from the 8-cent fare, the International seeks a higher valuation than the $22,000,000 allowed by the commission when it boosted the fare from 7 to 8 cents in Buffalo. At the time of the ruling, Commissioners Semple, VanNamee and Prendergast said that valuation should be higher, but did not indicate any amount. Commissioner Lunn has now replaced Commissioner Semple, a fact which may have an important bearing on the case.

It is believed that the rehearing will be decided by argument, rather than through the production of witnesses by the city of Buffalo and the railway. The main effort of the company will be directed toward establishing certain sums for going value and fees to Mitten Management, Inc., as part of the valuation of the city lines. These two items were eliminated by Commissioner Pooley at the previous hearing.

Little progress has been made by the railway and representatives of the city of Buffalo and Chamber of Commerce at the city-company conferences on a service-at-cost plan of operation under municipal supervision. Several meetings have been held. The Chamber of Commerce has suggested that the company be allowed a fixed return of $1,800,000 annually, but the City Council opposed this amount. It is reported the railway would be satisfied with this amount.

One-Man Cars in Use on Several Cleveland Lines

Limited service with one-man cars is still being operated by the Cleveland Railway. Thus the company is sustained in the contention which it made last December about the need of these cars when the question of their operation threatened to become a political issue. The December losses by the company on the Lakewood lines assumed such proportions that the company put one of the three lines, namely, the Clifton Boulevard line, on the one-man basis, and at that time said it might be necessary to extend this plan to the two other lines, the Madison Avenue line and the Detroit Avenue line, in Lakewood.

Following this, the city of Lakewood arrested the operators of the one-man cars and subsequently the officials of Lakewood and the company met in an attempt to arrive at a peaceable solution. This came on Dec. 31, when the controversy was settled by the company returning to two-man operation of the Clifton Boulevard lines in Lakewood and by the city of Lakewood modifying the company's franchise so as to make the rate of fare to Lakewood riders the same as that obtaining in Cleveland. The Lakewood fare previously had been 5 cents; the city fare was 6 cents or nine tickets for 50 cents.

Lakewood amended the franchise, which amendment was accepted by the company, with the approval of the city of Cleveland, and the police court cases against the one-man operators were nulled. At the time the Lakewood warrants were issued, Cleveland and Newburgh Heights took similar action, but these cases were likewise nulled.

The cars on the East Thirtieth Street crosstown line in Cleveland still are being operated by one man and have been operated that way since its inception. At present this line and several outlying stub lines of light traffic are the only ones operated on the one-man plan by the Cleveland Railway.

$5,000,000 Long Island Electrification Ahead

George Le Boutillier, vice-president of the Long Island Railroad, says the main line to Mineola will be the next to be electrified and that plans are now being considered by the engineers of the road for this work. The line will then be continued to Oyster Bay and Hicksville, and the latter station will be the terminus of the electric road, where an electric motor will pick up the trains drawn by a steam locomotive and run them into Manhattan and Brooklyn. This will mean that the residents of Mineola will have two electric roads to draw from. The cost of the new work, including equipment, will be $5,000,000. It is expected that by Sept. 15 definite announcement will be made as to just when the new work will be commenced. In discussing the problems of the Long Island Mr. Le Boutillier said:

> We borrowed $4,000,000 from the Pennsylvania Railroad on an open account at 5 per cent. We must put this property on a paying basis. How to raise our net income is a problem. One-third comes from freight and two-thirds from passengers, so I determined to raise our commutation rates. There will be 87,000 users of this form of ticket each month this summer, and the net increase for each person would be only $1.87 a month. We carry our commuters at the rate of 4½ mills a mile, and the average haul is 15.1 miles. The great problem we have to face is our short hauls. Forty-eight per cent of our business is from commuters. If we could get rid of our load west of Jamaica, we have enough capacity to take care of everything east of Jamaica for the next 25 years. That is the big problem that is facing us.

Bus Competition Restrained in Brooklyn

The Brooklyn City Railroad and the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., won their fights against competing lines by default on June 8. The Queens Bus Lines, Inc., failed to appear or interpose opposition in Justice May's part of the Supreme Court.

Counsel for the Brooklyn City asked for an injunction against the bus line that ran between Erie Basin and Borough Hall. The Coney Island & Brooklyn Railroad asked for similar relief against the bus line that had been operating between Erie Basin and Park Circle. Both bus lines were suspended a few days after they were started by a preliminary injunction issued by Justice MacCrate. It is believed that the bus lines decided, after the temporary injunction had been obtained, to abandon permanently the lines to which the railroads objected. The injunction was, however, made permanent.

Company After Canal Bed Line at Rochester

Operation of the industrial railroad in the abandoned Erie canal bed owned by the city of Rochester is sought by the New York State Railways. At a conference between James F. Hamilton, president of the railway, and former Senator George F. Argetsinger of the city subway planning committee, Mr. Hamilton frankly stated that his company desires exclusive operation of the lines in the canal bed. If this is denied, neither the city nor the interurban street car lines will be diverted into the city-owned tracks.

Mr. Hamilton pointed out that the electric railways have the equipment and force to begin operation the day the subway is finished, while the city would face an expense of more than $1,000,000 for equipment alone and lacks the necessary personnel. He is expected at an early conference to submit a detailed plan for operation.

The subway railroad uses the old "Big Ditch" of George Clinton through the heart of the city for more than 6 miles. It was proposed to extend the line to the suburb of Brighton. Tracks had been laid and work pushed on this end of the railroad, when Governor Smith's veto of a bill to annex Brighton lands halted that part of the project. Unless legislation is passed providing for the annexation of the needed lands, Rochester & Eastern interurban cars and a city route will be diverted into the canal bed at the southeastern rim of the city.

Canadian Wins Bonbright $5,000 Prize

Names of the winners of the $10,000 in prizes offered by Bonbright & Company, New York, for the best power essay written as of 1930 and covering a ten-year period from 1920 were announced on June 17 at the National Electric Light Association convention in San Francisco.

David Cowan, 21 years old, of English birth and now with the Sun Life Assurance Company, Montreal, receives the first prize of $5,000, while Robert M. Davis, statistical editor of *Electrical World*, a McGraw-Hill publication, was the winner of the second prize of $1,000. There were 438 papers.

John Dockendorf of Milwaukee, Wis., won the third prize of $500.

In addition to the foregoing prizes there remains the cash award of $10,000 to "that contestant whose paper, reviewed again in 1930, shall appear to have most nearly approximated to facts as they eventuate." Thus the winners of the Bonbright award who wrote on five years of past progress in the power industry, and five years of visualized future progress, as well as those whose essays did not take any present awards, have the opportunity of winning a single cash prize of $10,000. The same essays will be rejudged in 1930. The judges are to be the directors of the American Superpower Corporation, who were the judges in the contest just closed.

They are said to have found it difficult to decide which of the first two essays was the better.

Weekly Pass for Springfield, Mass.

As a means of increasing revenue two plans for the issuance of dated pass tickets good for an unlimited number of rides on certain lines are under consideration by the Springfield Street Railway, Springfield, Mass. One plan involves the issuing of weekly commutation tickets good on a line for any number of trips during a given week. The second new idea concerns a trip ticket good on Sundays for any line in the city any number of times. It is said that this ticket might be sold for 25 cents.

Municipal Difficulties in Louisville May Affect Railway

Action of the Kentucky Court of Appeals on June 12 may have considerable effect on the Louisville Railway, as the decision of the court has unseated 38 Councilmen and park commissioners. Those ousted will have 30 days in which to file an appeal, and as the Court of Appeals adjourns for the summer within a few days, there may be no action on the appeal until fall.

Certain members of the City Council have been rather hostile to the Louisville Railway of late and have not only been fighting a proposal for an increased fare to straight 7 cents, as a result of heavy reduction in the barometer fund, but have urged a 5-cent fare on some lines and questioned the right of the railway to charge certain expenses to the operation where they affect the barometer fund. Complaint was raised to operation of the company's bus subsidiary. Indications are that another Council will be seated before the matter of any change in fares comes up for action.

Seeks Relief from Competition in Huntsville

J. M. Barry, an official of the Alabama Power Company, told the City Council at Huntsville, Ala., recently that unless something could be done to increase traffic the company would ask the commission for permission to discontinue railway service in Huntsville. The matter was referred to the street committee of the City Council. Some time ago the City Council of Huntsville adopted an ordinance putting the jitneys off the streets, but the jitney owners took the matter to the courts and are operating unmolested.

Philadelphia Northeast Transit Subject Before Council

Thomas E. Mitten, chairman of the executive committee of the Philadelphia Rapid Transit Company, Philadelphia, Pa., recently forwarded to the Mayor a letter seeking an extension of the lease for the Frankford L which will expire on Nov. 5, 1927, and also consideration for an extended transit service in the Tacony-Holmesburg section. His letter included a recommendation of the city-company engineers that a bus line instead of car tracks be financed and operated by the P. R. T. between Poquessing Creek and Rhawn Street on Frankford Avenue, to make connection with the Frankford L at a 10-cent fare with a 3-cent exchange ticket, as is now done on the Roosevelt Boulevard. It was his idea that a consideration of the Tacony-Holmesburg extended service could not be intelligently undertaken without a coincident understanding with the city as to the extension of the Frankford L lease. He said consideration of the extension of the Frankford L lease demonstrates that the 1926 rental from the P. R. T. will have to be increased by about $300,000 to satisfy the interest and sinking fund charges on the city bonds.

The letter to the Mayor was read in the Council, as well as another statement containing conclusions of Director of City Transit Ehlers and Ralph T. Senter, vice-president of the P. R. T., regarding the acquisition, reconstruction and operation of the Northeast surface line.

Benefit Association Formed in West Chester

The Chester Valley Lines Employees' Association was recently organized to further the welfare of the men employed in the various departments of the unified electric railway and bus systems of the West Chester Street Railway, West Chester, Pa., to cooperate wth the management in the maintaining of a high standard of service to patrons and wherever possible to assist in improving the service. The new organization is the outgrowth of a movement started some months ago by the management of the Chester Valley Lines to give tangible evidence of its interest in the welfare of the men.

A feature of the plan is the awarding of monthly cash prizes to the employees for the best report containing criticisms of the operation of the railway and bus service and suggestions for economy. Among the benefits is the payment of a sick benefit up to $25 a week on a 50-50 basis, the association paying one-half and the company the other.

At the get-together meeting at which the association was formed Charles B. Cooke, Jr., president, said that the one basic reason for the existence of the company and of the men's jobs was to give the public a fair measure of transportation service in return for the money the people paid in trolley and bus fares.

Arbitration of New York Subway Routes

Mayor Hylan of New York met virtual defeat at a meeting of the Board of Estimate on June 16 when a coalition of Borough Presidents, supported by Comptroller Craig, forced him to postpone action and agree to arbitration on the disputed angles of his $542,000,000 municipal subway program. After a prolonged hearing Mayor Hylan announced that consideration of the plan would be put over until July 1, at which time the Board of Estimate is to convene in special session to dispose of the matter. In the meantime, while no actual committee was appointed, the five borough heads are to confer with Chairman Delaney with a view to ironing out their differences.

More Parking Rules Announc

The St. Louis, Mo., Traffic Counc has announced that, effective June 23, all parking on Third Street between St. Charles and Spruce will be prohibited, while on Second Street, Main Street and all cross streets east of Fourth Street, between Washington Avenue and Spruce Street, one-hour parking on one side of the street only will be permitted. Center-of-the-street parking on Twelfth Boulevard with the exception of between St. Charles and Locust Boulevard will also be abolished on July 1.

Committee Approves Referendum for Rainier Purchase

A resolution providing for a referendum rider on legislation to provide for the purchase of the Seattle & Rainier Valley Railway line in Seattle, Wash., until the purchase ordinance has been introduced was passed by the utilities committee of the City Council on June 11. At the previous Council meeting Councilman John E. Carroll offered a proposal for referendum proceedings involving a promise to submit to an advisory vote of the people the Council's offer of $1,200,000 for the railway property before closing the deal. At this meeting Councilman Carroll made an effort to force a vote on his resolution, but it was defeated, the resolution that it be referred to the city utilities and finance committees carrying by a decisive majority.

Tri-City Men Accept Compromise Offer

A general strike of operators of the Tri-City Railway in Davenport, Iowa, and in Rock Island, Moline and East Moline, Ill., as well as suburban communities served by the lines, was averted on June 13 when the men voted to accept the compromise offer of the railway. Thus the present wage scale of 58½ cents an hour will continue until June 1, 1926. The wage question cannot be opened prior to Nov. 1, 1925, and then must be arbitrated if not agreed upon. This was a concession to the men, the company having held out for a 30-day reopening clause.

A contract covering working conditions and similar to that now existent will continue from year to year, unless opened after a year from date on 30 days' notice. The company contended that its receipts were constantly falling below expenditures and that it could not be bound for a year.

Detroit United Seeks Fare Increase

The Security Trust Company, receiver for Detroit United Railway, Detroit, Mich., has applied to the Public Utilities Commission for authority to increase fares to 3 cents a mile. The highest present fare is 2½ cents a mile. A statement of earnings and expenses filed with the petition shows the Detroit United Railway failed to meet expenses, depreciation, maintenance and 7 per cent return in the year ended Dec. 31, 1924, by $1,707,320 and by $342,791 in January and February this year.

Recent Bus Developments

New Haven Road Recognizes Bus—Richmond Property Unifies Railway and Bus—Cleveland Service in August

THE New York, New Haven & Hartford Railroad is going into the bus business. Formal announcement to this effect was made on June 16. The company finds that there are some portions of its system which cannot be operated economically even by gasoline cars for passenger service with the frequency of service desired by the public. Where such conditions exist, the company intends, so far as possible, to continue to perform freight service and such passenger train or gas rail car service as may be required, and to operate over parallel highways with buses.

In addition there are other points on its rail lines now reached by circuitous runs, compared with the distances over the recently constructed highways. It is the company's plan to consider highway bus service between these points. Says the railroad:

> This policy of the company is to be carried out with the intention of furnishing an adequate passenger service in connection with its rail lines; to give to the public the accommodation which the demands of its patrons required, and to use that mode of transportation which is the most efficient, economical and best adapted to the performance of good service.

A subsidiary company, the New England Transportation Company, has been created through which the arrangements for plant and equipment will be promptly progressed. Routes and service will be developed and the approval of the state commissions will be sought.

Stone & Webster, executives of the syndicate which has acquired control of the Virginia Railway & Power Company, Richmond, Va., will assume control of the Richmond property with the idea of bringing about unification of the motor bus and railway transportation services, according to recent statements in the *Times-Dispatch*. In reply to a question as to their attitude toward the proposed acquisition of the Richmond Rapid Transit Corporation, Stone & Webster sent the following telegram:

> Answering your telegram: Our view is that a growing and progressive city absolutely requires a unified and co-ordinated transportation system.

When this telegram was read to him, W. L. Warren, president of the Richmond Rapid Transit Corporation, said that his company was "perfectly willing to listen to any proposition which the new owners of the Virginia Railway & Power may make." He is quoted:

> However, I am morally certain that a majority of the stock owners would not give serious consideration to any offer which lists the same terms submitted by the Mack Truck people. The directors of our corporation are citizens of Richmond who want to do what is best for the city. We agree with Stone & Webster in that a unified system of transportation is the logical solution of the problem, and we are willing to settle on a fair basis. Meanwhile, the service which we inaugurated for the benefit of the city has become profitable and will remain so unless we are subjected to unfair competition.

H. V. Godbold, vice-president of the corporation, said that the corporation was entirely satisfied with its present operation, but that the directors would not stand in the way of a unified transportation system if they were offered a fair price.

Bus operation by the Cleveland Railway, Cleveland, Ohio, will not be started until some time in July. Only a few buses are expected to be put in service then, and not until some time in August will buses be put on major service lines. Bus service is authorized by the Collister-Krueger law, under which, effective on June 15, home rule was applied to municipalities in bus transportation.

Interurban bus service between Rockford, Ill., and Janesville, Wis., has been started by the Rockford & Interurban Railway. Rockford Aldermen granted a city terminal route only a few days before the plan became effective. Seven cars are run each day. They cover the route in 85 minutes. Train connections are made for Madison, Milwaukee, St. Paul and Duluth.

The Tama & Toledo Railroad, Toledo, Iowa, discontinued its passenger service June 17. A bus service was placed in operation between the two cities.

The St. Louis Board of Public Service has granted the St. Louis Bus Company, subsidiary of the United Railways, a special permit to operate buses on De Baliviere Avenue between Delmar Boulevard and the Municipal Theater in Forest Park during the ten weeks' summer opera season. The permit to the St. Louis company is restricted to theater hours. The St. Louis Bus Company interchanges transfers with buses of other lines of the company and with the street car lines.

The City Council of Davenport, Iowa, has rejected the proposal of the Tri-City Railway to substitute bus service for railway service on the Mount Ida and Fejervary park lines. This action was taken after the committee met and considered the proposal of the company to abandon car tracks on streets scheduled to be paved this season. The opinion of the committee was that the company should be required to carry out provisions of its franchise and agreement entered into with the city regarding the widening of Bridge Avenue.

The Board of Park Commissioners, Baltimore, has received an offer from the United Railways & Electric Company to operate buses to the central section of Druid Hill Park. In the company's proposition it was stated that a 5-cent fare would be charged from the entrance of the park to the interior.

The Chicago & Joliet Transportation line, operating buses in supplementary service to the Chicago & Joliet Electric Railway, has filed a petition for authority to operate a bus line through the west central residential district of Joliet, Ill.

The Rochester Interurban Bus Company, owned by the New York State Railways, has petitioned the State Public Service Commission for the right to operate a bus system in western New York. The company, purchased last winter from an independent, operates between Rochester and Hornell. It is proposed to open lines connecting Rochester with Livonia and Lakeville and with Silver Lake, a summer resort 45 miles south of Rochester, and to open a line from Lakeville and Long Point on the west side of Conesus Lake. At a recent hearing before I. C. Ward, assistant counsel for the state commission, attorneys for the Erie and other railroads opposed the application, charging that the New York Central, which controls the New York State Railways, is seeking to extend its territory by acquiring control of virtually all western and central New York bus and electric lines.

The division of franchises of the Board of Estimate of New York City filed a report with the board on June 15 which recommended that most of the 46 applications for franchises to operate buses in New York City be returned to the 38 applicants for revision and correction. The report itself was noncommittal as to the relative merits of the applicants and merely stated that the applicants for bus operating franchises "seem to have failed to understand what information was desired." This report was referred to the Board of Transportation and will be taken up at the next meeting. Among the applicants were several street railways.

The Tennessee Electric Power Company has recently established a bus line in the section of Chattanooga east of Missionary Ridge. The decision to start this service to territory not now being served by the railway was reached after several months of careful investigation. The plan calls for two lines. Five buses were purchased by the company at an initial expenditure of about $50,000.

The Massachusetts Coach Company, an independent bus company, and the Boston Elevated Railway, Boston, Mass., recently reached an agreement whereby they operate on regular schedules, meeting bus for bus, affording a practically continuous journey to East Milton and West Quincy. The independent corporation operates Mack buses on a route between West Quincy, East Milton and the Boston city line. The Boston Elevated discontinued trolley service on the Adams Street-Dorchester line and substituted five buses to take care of the traffic. Fare on the 3-mile route of the Boston Elevated is 6 cents and on the 3½-mile route of the coach company is 10 cents or a strip of ten tickets for 75 cents.

Three Mack buses have been received by the Bloomington, Ill., division of the Illinois Power & Light Company for use on the South Main Street line during new railroad viaduct construction work. The buses, however, are to become an integral part of the traction system and will be used as feeders for the lines and in sections not now regularly served.

The North Carolina Public Service Corporation recently established bus service in Glenwood, in order to give the people of that section of Greensboro means of transportation while the company is tearing up and relocating its tracks through Glenwood.

The Skippack & Perkiomen Transit Company, Norristown, Pa., recently ceased to function. Three rich agricultural sections of Montgomery County will be served with transportation facilities by the Montgomery Bus Company, which has started its service over the old route of the transit lines.

The Chicago, Milwaukee & St. Paul Railroad with 646 miles of electrified line, has started bus service at several points as auxiliary to its steam trains. Following the receipt of formal approval of its bus plan by the Interstate Commerce Commission, the railroad, will operate its first bus line in Wisconsin between Racine and Sturtevant, in the southern part of the state, and another line in the northern part of the state between Minocqua and Boulder Junction. The buses will meet all trains. Train service on the Racine and Minocqua subdivision will be limited to freight and express business.

Mayor Ulrich Wiesendanger of Yonkers, N. Y., on June 13 granted the Yonkers Railroad, a subsidiary of the Third Avenue Railway, New York, a certificate to begin operation of buses on three of the five streets on which it has discontinued its railway lines. The bus fare is to be 10 cents. Some weeks ago the right to operate twelve bus routes in Yonkers was granted to the Westchester County Bus System, Inc. Later the Mayor announced that he had decided to veto the ordinance passed by the Yonkers Aldermen to give the permit for the sole operation of buses in Yonkers to the Westchester County Bus System, Inc.

The Public Service Commission has approved the schedule of the new line of the Binghamton Railway Bus Lines, Inc., operating in Johnson City, N. Y. The fare for adults and children is 7 cents. The Binghamton Railway has filed a tariff, effective July 1, 1925, providing that passengers paying regular fare to Johnson City will, upon request, be given transfers to the Binghamton Railway Bus Lines, Inc. Transfers so given will be accepted for the same transportation as would be given upon the payment of the line's regular cash fare. Passengers paying the regular fare for transportation on the bus line in Johnson City will be given transfer to the Binghamton Railway, which will be accepted for the same transportation as would be given upon the payment of a regular cash fare of 7 cents.

The board of the town of Salamanca, N. Y., recently refused the petition of the Olean, Bradford & Salamanca Railway to operate buses through the town on its proposed route from Little Valley to Salamanca. Supervisor L. B. Hall produced a letter from Mr. Benedict, president of the Iroquois Indian Trail Motor Coach Company, Buffalo, in which he expressed opposition to granting the franchise.

News Notes

Requests Seven-Cent Fare.—E. Randolph Williams, counsel for the Virginia Railway & Power Company, Richmond, Va., made oral request to the State Corporation Commission on June 11 for a 7-cent fare with a 3½-cent fare for school children, pending the fixing of a permanent rate of fare. Mr. Williams said the company was not earning 6 per cent even on the lowest of the three valuation estimates submitted to the commission. It is expected the commission will rule on the permanent fare by July 15.

Wants Fare Reduced at Midnight.—The City Council of Montreal, Que., has adopted a resolution to the effect that the Tramways Commission be requested to consider the advisability of reducing the fare between midnight and 5 a. m. from 15 cents to 10 cents; further, that as far as the city is concerned the commission should be informed that it agrees to this reduction. The resolution was adopted on the suggestion of Alderman Brodeur.

By-Law for Improvements Approved.—The Sandwich Council at a recent special meeting approved a by-law submitted by the Hydro-Electric Power Commission of Ontario authorizing the issuance of debentures for $70,000 covering street railway extensions in the county town. The debentures will not be sold, but held as collateral. By-laws were passed authorizing local improvements to cost about $125,000.

Will Vote on Cars or Buses.—The town of Weston, Ont., will vote on June 27 on the question of continuing the present railway service or using buses. The by-law to be presented to the people will be on the purchase of the Toronto Suburban Railway for $25,000, the understanding being that if the by-law is voted down the town will resort to a system of bus service.

Will Raise Fares.—The Southwestern Gas & Electric Company has informed the City Councils of both the Arkansas and Texas sides of Texarkana that it will put in force 7 and 4-cent fares within the next 30 days, raising the rates from 5 and 2½ cents. The company says it has been losing money annually for several years.

Will Ask for Increase in Fares.—The Quincy Railway, Quincy, Ill., operated by the Illinois Power & Light Corporation, is preparing to ask the Illinois Commerce Commission for authority to increase its fares from 7 to 10 cents and its ticket rates from four for 25 cents to five for 35 cents. School children fares of 2.5 cents will remain unchanged. The Quincy Chamber of Commerce indorsed the proposed increase. The company has abandoned plans for extensions of lines this year inasmuch as the South Eighth Street bus line will cost $73,000 and other improvements on South Eighth and State Streets will run to $100,000.

Seeks to Run One-Man Cars.—Application has been filed by the Wisconsin Rapids Street Railroad, Wisconsin Rapids, Wis., with the Railroad Commission for permission to establish one-man car service on its interurban line between Wisconsin Rapids and Nekoosa.

"All-Day" Ticket.—To popularize trolley and bus riding and to stabilize travel at all hours of the day, the Chester Valley lines, consisting of the West Chester Street Railway and its bus subsidiaries, has issued an "All-Day Ride-as-You-Please Ticket." This is good for passage, on the date indicated, over any and all of the 250 miles of electric railway and bus routes operated by this system in Chester, Delaware and Montgomery Counties, Pa., and Upper New Castle County, Del.

Levis Adds Weekly Pass.—The Levis County Railway, Levis, Que., added the weekly pass on May 17 at $1 for use on its single-fare routes. These routes have a cash fare of 10 cents and a ticket fare of four for 30 cents.

Withdrawal of Railway Service Protested. — Residents of Merchantville, N. J., held a mass meeting recently and protested against the proposition of the Public Service Railway to abandon its railway east of Franklin Street in that town. Martin Schreiber, general manager of the company in South Jersey, said that if the company were permitted to abandon the line a number of buses would be placed in service in addition to those now operated. He said the company would not try to force the people to agree to the change proposed, but that the matter was one for the Board of Public Utility Commissioners to settle.

Plans Ahead for Interstate Bus Bill.—A bill, formidably supported, will probably be introduced in the next session of Congress with the object of regulating the operation of buses engaged in interstate commerce. The purpose will be to prevent "unfair competition" with the railroads.

Petitions for 5-Cent Interurban Fare.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has petitioned the Railroad Commission for permission to establish a new 5-cent interurban fare between Fort Smith and Van Buren, Ark., in addition to the fare charged within the cities.

Privileges to Increase Traffic.—In an effort to build up its patronage the Bakersfield & Kern Electric Railway has put into effect the weekly pass in Bakersfield, Cal. In addition to popularizing the system through this cheap fare the company has announced an extension of transfer privileges for outbound Baker Street passengers. The decision to extend the transfer limits from the Southern Pacific station to the corner of Baker and Kentucky Streets was announced by Superintendent Mickelberry, who said that the change would be particularly advantageous to cash and token passengers. It has been urged upon the citizens of Bakersfield to ride the street cars whenever opportunity presents to escape "the fate which has befallen Phoenix and other cities which have lost their street car systems."

Foreign News

Moroccan Railway Progress

The inauguration of the electrified railway line from Casablanca to the capital Rabat took place on April 21. The line crosses the Bou Regreg on a steel bridge 203 m. in length and passes under the city of Rabat by a tunnel 1,200 m. long, thus preserving the beauty of this garden city laid out on the lines of the French engineer Proust since the French occupation in 1912.

In 1920 the Compagnie des Chemins de Fer du Maroc received a concession for the construction and operation of 1,000 km. of line. Of this the spur from Casablanca to Rabat, 85 km., is the first to be put into operation. This connects the chief commercial city and seaport with the capital and forms a part of the line Casablanca-Kenitra (125 km.), of which the section Kenitra-Rabat has already been operating with steam power for two years.

The railways of Morocco for some years are destined to be trunk lines, which will be fed for the most part by auto truck and stage services, the rail being used only for the bringing of phosphates and farm products to tidewater at the Atlantic ports of Kenitra, Mehedaya, Fedallah and Casablanca.

Austria Receives $18,000,000 for Electrification

The finance committee of the League of Nations has released $18,000,000 from the League's loan to Austria to be used for the electrification of the Austrian railroads. The government originally asked for $25,000,000. Dr. Zimmermann, the league commissioner, opposed the use of the money for this purpose, and the league's decision represents a compromise favorable to Austria.

The money is to be used to electrify the Tyrolean Railroad from Salzburg to Brudenz and the Brenner line. They connect Austria with Italy and Switzerland and are most important from a commercial and tourist viewpoint. The proposal to electrify the famous Semmering line, connecting Vienna with the most popular mountain resort, was refused on the ground that the railroad was for luxury purposes.

Electric Auto Bus Develops in France

Further development of the electrically propelled auto bus appears to be imminent on a grand scale in France. The Renault firm is producing an electric bus for town use, fitted with accumulators, or batteries, put out by the Dinin firm, which is expected shortly to have its trial on Paris streets. Lyons, in mid France, now has twelve electric buses in service, described in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 14, p. 276. The subject of electric buses for France is being pushed forward by that puissant association the Society for the Development of Electric Vehicles. Since the war this body has been actively engaged in encouraging the development of charging stations, particularly in the Paris and Lyons districts.

Speed Reduced on Paris-Orléans

Due to two recent accidents on the Orléans line, caused in each case, it is believed, from too high a speed during the period of re-laying the lines and installation of electric equipment, the French Minister of Public Works has ordered an immediate reduction of speed of 25 per cent on all parts of the line where work of any nature is being carried on. In no case can the speed exceed 80 km. (50 miles) an hour.

Electrification Progress on the Midi Railway in France

The Midi Railway, paralleling the French slope of the Pyrenees in southern France, is perhaps the first French railway (of a total length of 4,116 km.) to carry out its entire electrification scheme, or at least is in advance of that of other French lines still working out the same problem. In the Valley of the Ossau the Hourat generating station is ready for operation. The Miegebat station will be ready shortly. The 150,000-volt system of transmission lines is completed and is working provisionally at 60,000 volts.

Electric trains are circulating from Toulouse to Dax with branch lines to Pierrefitte, Bagnères de Bigorre and Arreau. The electrification of the line to Luchon, a watering place, will be completed the coming summer.

The electric installations on the important sections from Dax to Hendaye at the Spanish frontier and from Bordeaux to Irun in Spain are already completed, and trials will be carried out soon to endow these important traffic sections with a new, fast and more frequent service. From Dax to Bordeaux to Archachon will see the completion of the electric installation during the present year. In all, the sections under electric operation or soon to be so operated total 500 km., by far the most pretentious installation of its kind in France.

There are 55 electric locomotives under construction and fifteen electric motor cars. Electric lighting has been installed during the past year in 220 passenger coaches, in conformity with a law which provides that electric lights shall be installed in all passenger-carrying cars before 1927.

The auto-bus feeder services of the company running through the high valleys of the Pyrenees and elsewhere in proximity to the line are in full operation, but owing to the climatic conditions of the past summer have not given the returns expected.

Wireless on Tram Cars.—Tram cars in Stockholm have been equipped with wireless, so the journeys are now enlivened by concerts and bulletins of the latest news.

Abandonment Under Consideration.—An inquiry was recently held into the application made to the Ministry of Transport by the Dudley, Stourbridge & District Electric Traction Company to abandon its tramway in the Kingswinford area. The reason, it is stated, is that the tramway does not pay. If abandoned, it will cut out an important section of tramways running through the Black Country.

New Polish Tramway Project.—Construction of the new electric tramway from Warsaw to Zatrardow, a distance of 28 miles, is being financed by the Power & Traction Finance Company, Ltd. The estimated cost of this construction is £600,000.

Station Train Indicators on London Underground.—The illuminated frames at stations on the Metropolitan District Railway showing the destinations of the next three trains has proved so successful that the scheme is being extended to some of the tube railways. In the past there was no need for such an arrangement on the tubes, as with one exception they had no branches or junctions. Through recent developments the state of simplicity has to some extent gone, particularly on the two lines now interconnected, the Charing Cross & Hampstead and the City & South London Railways. On these the companies are installing a complete system of station and signal cabin automatic indicators.

South African Railways to Electrify.—Electrification of the suburban lines of the South African Railways from Capetown to the naval port of Simonstown and the seaside resorts of Kalk Bay and Muizenberg and from Capetown to Sea Point is to be started soon. Contract for the electrical equipment has been awarded to the English Electric Company. The value of the contract is estimated at £350,000 and includes equipment for 83 motor and 133 trail cars.

Electrification Scheme Progresses.—Recent United States Commerce Reports refer to a report that an estimate of about 33,000,000 rupees for the electrification and doubling of the lines of the South Indian Railway in the suburbs of Madras has been sent to the home board by the authorities of the railway at Trichonopoly. It is said further that as soon as a reply is received the estimate will be forwarded to the railway board at Delhi for the necessary sanction.

Electrification Agreement Recorded.—The *Journal Officiel* of the Société des Tramways Bretons publishes under date of May 1, an agreement for the electrification of the interurban lines of the Breton Tramways from St. Malo to St. Servan and Paramé on the north Breton coast. It is assumed that the local authorities will be willing to allow the state to control the enterprise. The district served comprises three important summer resort towns, where the present steam tram facilities are found utterly unable to cope with the increase in summer traffic.

Financial and Corporate

Seattle Municipal Railway Deficits Explained

D. W. Henderson, general superintendent of the Seattle Municipal Railway, Seattle, Wash., gave out a statement on June 10 explaining the deficit of $68,789 shown on the records of the lines for the first four months of this year and the cumulative deficit of $615,928 with which the lines finished the year 1924. He said that the deficit of $68,789, referred to in the *Times* of June 3, did not represent any loss in operation or affect the finances of the railway. It represented merely a plant loss due to the tearing up of "dead car tracks." According to Mr. Henderson the road is meeting all obligations and reducing its deficit.

With respect to the item which appeared in the *Times* on the deficit of $615,928, Mr. Henderson said the paper did not say that during that same year the deficit had been reduced $369,431.

He said it was a matter of common knowledge that during the first years of municipal operation under inadequate fares the system ran heavily in debt. The deficit at the end of 1920 was $1,814,163. Under the adequate 8⅓-cent fare the deficit had been reduced to $877,491 at the end of 1922. In 1923 another three months' experiment with the 5-cent fare was made. This resulted in a decrease of revenue of $512,713 for the year compared with 1922, although the deficit increased only to $985,359 due to economies in operation. If it had not been for the experiment with the 5-cent fare in 1923, he thought the railway deficit would have been virtually wiped out by now. Even with that setback the railway reduced the deficit of $1,814,163 in 1920 to $615,928 at the end of 1924. Mr. Henderson said:

> We have met all operating costs, interest on bonds and bond payments and have reduced our deficit $1,198,235 during the last four years.
>
> The municipal railway belongs to the people of Seattle. They are entitled to the facts regarding its operation and finances. We desire the friendly co-operation of the press and of the people of Seattle in making the railway successful.

Dividend Action Deferred at Duluth

Directors of the Duluth-Superior Traction Company, Duluth, Minn., at their recent meeting deferred action in regard to a distribution of the common shares. It was felt that the recent showing in regard to gross income did not warrant action at this time and the matter was left over until next quarter. Earnings are said to be better than a year ago, but not quite so good as in 1923. In Duluth the improvement for May was about 12 per cent, but in Superior the earnings showed a decline of about 5 per cent, cutting the general improvement below the 10 per cent, which it was hoped to be able to maintain. According to the *Canadian Financial Post*, from which these facts are taken, the automobile has created Duluth-Superior's main problem. Not only is there jitney competition to be considered but the ever-increasing number of car drivers cuts seriously into traffic returns. The company is still experiencing some competition from jitneys in Superior, while in Duluth, where the jitney competition has been restrained, there is still the issue of the increased fares, and until it is settled the margin of profit on operation is a doubtful quantity even though gross returns are showing a nice increase.

Income Tax Ruling

No Deduction for Losses Permitted While Subsidiary Continues as Active Entity

The United States Board of Tax Appeals handed down a decision on May 20 in the appeal of the Portland Railway, Light & Power Company Portland, Ore., from a ruling of the federal income tax commissioner.

The first point considered in the decision was in connection with advances which the railway company, whose name is now the Portland Electric Power Company, made each year from 1915 to 1924 to the Willamette Valley Southern Railway. The Portland Electric Power Company owns all of the preferred stock of this company and about 55 per cent of its common stock, and it has also guaranteed the payment of interest and principal on its bonds. The Willamette company has shown continual deficits which have had to be met by advances from the Portland company mentioned above, and these advances the Portland company wishes to charge off as losses on the ground that the Willamette company is insolvent. The Board of Tax Appeals decided, however, that this cannot be done "so long as the corporation to which such advances are made continues as an active corporate entity, is not actually adjudged bankrupt and no effort made to close or liquidate the account."

Another claim for deduction by the Portland company was in regard to the sale at a loss of some real estate purchased in 1907 at $119,628 and sold in 1920 at $88,000. The fair market value on March 1, 1913, was $151,538, and the company claimed the difference between the sales price and this latter figure, less $4,531 depreciation. The commissioner, however, deducted the sale price from the cost price and also deducted the sum of $10,373 for depreciation in 1907. This left only a loss of $21,255 as against a loss of approximately $59,000, claimed by the Portland company. On this point, the action of the commissioner in choosing between the basis of March 1, 1913, or cost, whichever gave the lower figure of loss, was sustained, on the basis of the decision of the United States Supreme Court on April 13, 1925. There was no dispute as to the amount of depreciation to be deducted for each year.

Memphis Gross and Net Earnings Off

The National Power & Light Company, New York, holding company for utilities serving 47 communities in Tennessee, Alabama, Arkansas and Texas, did a gross business of $22,886,444 in 1924, according to the annual report, an increase of 9½ per cent over 1923. Net earnings were $8,063,330, an increase of 15 per cent.

Of the earnings of subsidiaries, 50 per cent was derived from electric power and light services, 38 per cent from railway service and 12 per cent from manufactured gas and miscellaneous service. The subsidiaries reported 212,933 consumers, of whom 158,463 were electric and 54,470 were gas customers.

During the year the properties of the Birmingham Railway, Light & Power Company, the Bessemer Gas Company, Birmingham-Tidewater Railway and the Norwood Street Railway were acquired by the Birmingham Electric Company, which was organized for this purpose.

The only strictly street railway property of importance reporting is the Memphis Street Railway. It runs 183 miles of line and carried 53,985,680 passengers in 1924, 56,073,749 in 1923 and 56,035,125 in 1922. A statement of earnings for the year ended Dec. 31, 1924, compared with the previous year, follows:

STATEMENT OF EARNINGS OF MEMPHIS STREET RAILWAY

	1924	1923
Gross earnings from operation	$3,014,674	$3,154,526
Operating expenses, including taxes ..	2,121,690	2,189,370
Net earnings from operation	$892,984	$965,156
Other income	3,628	9,478
Total income	$896,612	$974,634
Interest on bonds..	454,195	480,043
Other interest and deductions	8,890	30,206
Balance	$433,527	$464,385
Dividends on preferred stock	125,000	100,000
Balance	$308,527	$364,385
Renewal and replacement reserve.	277,125	228,932
Balance for surplus	$31,402	$135,453

Seattle Seeks Stay in Tax Case

Seattle's Assistant Corporation Counsel, George Meagher, recently asked Federal Judge Neterer for a stay of proceedings in the suit of the Puget Sound Power & Light Company against the City of Seattle, Wash., to collect from it three-quarters of the tax on the Seattle Municipal Railway system for the year in which the system was taken over by the city. The court refused, holding it was premature as the mandate in the suit from the Circuit Court of Appeals had been returned to the higher court for a retaxing of the costs.

The city is asking for a stay of proceedings in the District Court pending the filing of an application for a writ of review from the Circuit Court findings to the United States Supreme Court. The case was carried to the Circuit Court of Appeals upon a decision of Judge Neterer sustaining a demurrer filed by the city and the county, which were made joint parties to the action. The Circuit Court reversed Judge Neterer in so far as the suit affected the city, but sustained him relative to the county, dismissing the action against that municipality.

The Puget Sound Power & Light Company is suing to collect from the city, under the provision of a city ordinance, three-quarters of the taxes levied against the street car system and paid by the company under protest.

Denver Reorganization Plan Declared Operative

Official announcement was made on June 9 that the reorganization plan for the Denver Tramway, Denver, Col., had been declared operative and that the securities to be issued in the reorganization already have been underwritten. Under the official decision of the reorganization managers in declaring the plan operative, the reorganization will probably be effective as of July 1.

The reorganized company will be headed by Ernest Stenger, the present receiver for the tramway under the United States District Court and president of the company before it was forced into a receivership.

Claude K. Boettcher, one of the reorganization managers, said:

> Security holders gave almost unanimous approval of the plan by depositing their stocks and bonds. I believe that the security holders were more nearly unanimous in support of this plan than any ever presented before in any similar instance.
>
> What few of the securities have not already been cared for have been underwritten by a few of the large owners, a simple matter in view of the response of the stockholders. In addition to the securities already deposited, more will be coming in within the next few weeks. Many bond and stock owners are in Europe at the present time and will deposit their securities as soon as possible. The time limit for security holders to participate in the plan by depositing their securities has been extended to July 15.
>
> The trustees for the bondholders are now preparing the necessary papers for filing in the federal court in foreclosure of the present company as the next important step in the reorganization. This will be done as soon as possible.
>
> Later a decision will be made as to the name of the new tramway company, which will be as nearly the same as at the present time as possible. It is possible we may go into another state to incorporate and keep the same name.

Detroit Financial Plan Announced

Forty per Cent Assessment Proposed—Execution of Plan Urged by Receivers—Unsecured Creditors Get Bonds—Foreclosure Would Follow Failure of Stockholders to Support Plan

A SPECIAL meeting of stockholders of the Detroit United Railway, Detroit, Mich., has been called for June 29 to vote on proposed issues of stocks and bonds and to consider the exchange of the present outstanding common stock for three issues of new stock, all to be put out as part of the plan for the reorganization of the railway.

The plan for refinancing the railway, which went into receivership last March, was mailed to stockholders and unsecured creditors by the receivers in Detroit on June 12. Under the plan general mortgage bonds not to exceed an aggregate principal amount of $8,000,000 will be issued to cover all the property of the corporation. The bonds will bear 6 per cent interest.

Of the $8,000,000 bonds, stockholders are asked to subscribe $6,150,000, and the remainder is to be taken up by unsecured creditors. Subscriptions would be payable in one-fifth installments monthly, beginning June 26 next.

The stockholders will vote on these questions:

(a) Considering creation of an issue of preferred stock, bearing cumulative dividends at rate of 3 per cent the first year, 4 per cent the second year, 5 per cent the third year and 6 per cent annually thereafter. An issue of two classes of common stock, to be known as class A and class B, of which class A shall be entitled to dividends of 7 per cent in any year before any dividends on class B in such year, but shall not participate in any further dividends in such year.

(b) Considering and voting on authorizing and requiring exchange of present outstanding common for said three issues of stock.

(c) Considering authorization of general mortgage bonds, not to exceed an aggregate principal amount of $8,000,000, bearing interest at the rate of 6 per cent annually, covering all the property of the corporation.

(d) Considering and voting on any modifications or additions to the foregoing that may be required.

(e) Considering accepting of articles of association so as to make such capital readjustment effective as of July 1, 1925.

(f) Considering a resolution to make provision for canceling of old and issuing new certificates, and on any other matters that may come before the meeting, whether incident to or in connection with matters and things aforesaid or otherwise.

A. L. Drum & Company, consulting engineers, retained by receivers, have succeeded in paring down expenses to the point where a fair profit is expected to be shown by the end of the current year. Drum & Company estimate the financial results of operation of the lines for the twelve months from July 1, 1925, to June 30, 1926, as follows:

Gross earnings	$7,957,636
Operating expenses and taxes	6,342,348
Net from transportation	$1,615,288
Other income	960,000
Net available for interest and depreciation	$2,575,288
Interest on existing bonds, after deducting $649,700 interest received from city of Detroit	1,020,000
Excess of interest received from city of Detroit allocated to excess bonds	208,000
Sinking fund payments	650,000
Total	$1,878,000
Balance available	$697,288

The estimate is predicated upon the following:

1. That a reorganization plan be adopted and be effective by July 1, 1925, at least to the extent of providing the funds required by the receivers estimated at $1,660,953.

2. That increased revenues in the amount of $1,010,000 for the twelve months will be derived from an increase in the rates of fare for interurban and city traffic.

3. That the total operating expenses for the twelve months will be $1,525,000 less than for the twelve months of 1924.

The sinking fund payments of $650,000 a year made from the rail earnings are more than sufficient to offset the accruing depreciation of the rail property.

The engineers explain that this forecast of the net earnings to be expected during the first year of operation of the reorganized property is based upon probably the minimum number of passengers that will ever under normal conditions be carried by the property; as the estimated number of passengers is 23.6 per cent less than the passengers actually carried in 1923, and 17.7 per cent less than the passengers actually carried in 1924. They say it is fair to assume that the large portion of this decrease in traffic, which is due to the present industrial depression, will be regained in future years and will contribute a substantial increase in the future net earnings of the property.

The receivers deem it necessary to provide for the immediate payment of a part of claim and other obligations amounting to $1,660,000 and that provision should be made for the payment of the balance, amounting to $950,000 over a period of a few years. They also feel that provision for these payments is necessary because they have a direct bearing on the receivers' ability to effect economies and increase revenues. No portion of the $1,660,000 immediately needed can be taken from operating revenues. In fact, the receivers have already used operating revenues to some extent and the operating funds must be reimbursed.

It was to this end that Judge C. Simonds, in the United States District Court, authorized receivers to issue certificates to the amount of $1,660,953. The certificates are to become payable July 1, 1926, and will be based on a lien on the D. U. R. property exclusive of that sold to the city of Detroit under the contract of March 10, 1922, which is specifically protected by the court order.

The right was reserved by the court to issue another order authorizing the receivers to issue more certificates to bring the total up to $1,800,000. The money derived from the certificates, according to the original application, is needed to meet requirements including the following: Changes and improvements, $184,056; land contracts, $241,210; miscellaneous, $173,000; probably unavoidable requirements listed as miscellaneous, $163,974; Wyondotte division, $160,300. The requirements for buses include an amount of $679,599 for equipment and $185,000 to complete payment for the Star Motor Coach Line and $66,550 in connection with the purchase of a majority of the stock of the Public Service Transit Company.

In a statement to the unsecured creditors of the railway the receivers say, in part, in referring to the demands made on the stockholders in order to protect their equity:

> It will be noted that the stockholders are called upon to subscribe and pay for in cash at par general mortgage bonds in an amount equivalent to 40 per cent of the par value of their stock. (There is $15,375,000 of stock outstanding.) No set of stockholders could reasonably be expected to do more. No lesser amount would be adequate. This amount will be sufficient if the creditors co-operate as contemplated by the plan. The new general mortgage bonds will rank next after the first mortgage and collateral trust sinking fund five-year 6 per cent bonds, of which $7,775,000 are now outstanding, against which there is up as collateral $2,000,000 of the 4½ per cent bonds which are being paid with the moneys paid by the city of Detroit on the purchase of the city lines. When, on July

1, 1929, the above-mentioned 6 per cent bonds all mature and are paid off the general mortgage bonds will then become first mortgage bonds. The plan to be successful further requires that the unsecured creditors shall take these general mortgage bonds in payment at par for their claims. Thus the present indebtedness will have the same standing as the new money.

The executed subscription agreement must be in the hands of the depositary not later than June 26, 1925. The time is short, but at least $600,000 must be in the hands of the receivers by July 1 and the other $1,000,000 then assured to be forthcoming as and when required. If the plan does not become operative because of lack of sufficient support by stockholders and creditors, there will of course be no funds from that source to take up the receivers' certificates. It was absolutely impossible for the receivers to work up definite and reliable data and information at any earlier time. If this plan is not supported, the receivers will be required to finance the certificates from some other source and also there will be no alternative but a sale of the property in due course of time under the decree of the court.

It will be understood that the plan is in no sense the receivers' plan, but the receivers have felt it their duty to the creditors to assist the stockholders in putting out the very best plan that the stockholders could possibly carry through. The receivers have also felt it to be their duty to make clear the merits of the plan and the conditions under which it is put out. Having done this to the best of their ability, it is for the creditors to consider and determine for themselves between subscribing to the plan or being able to protect themselves on a sale of the property.

The statistical record of the company has been reduced to the accompanying presentation:

CAPITALIZATION

	Authorized	Outstanding
Common stock	$25,000,000	$15,375,000

FUNDED DEBT

4½ per cent bonds, due 1932	$11,000,000
Underlying bonds on property	857,000
6 per cent first mortgage gold bonds	8,472,000
Underlying bonds of subsidiary companies	8,325,500
6 per cent collateral trust notes, due 1926	325,000
Gen. equipment trust certificates "A" due 1934	1,000,000

DIVIDEND RECORD

Year	Per Cent	Year	Per Cent
1901	4	1914	6
1902	4	1915	6
1903	4	1916	6¾
1904	4	1917	7¾
1905	4½	1918	8
1906	5	1919	8
1907	3¾	1920	8
1911	5	1921	2+2½
1912	5	1922	1½
1913	6	1923	3
		1924	3

MARKET RECORD

	Common	
Year	High	Low
1912	76½	55½
1913	80⅞	62¾
1914	73¾	62
1915	73	69
1916	128½	69
1917	128	104¾
1918	....	....
1919	113	93
1920	113¾	79¾
1951	96	50
1922	73	54
1923	79½	56
1924	72⅛	19⅛
1925	29	3¼

Insull Interests Buy the Manchester Traction

Negotiations for the purchase of the Manchester Traction, Light & Power Company, Manchester, N. H., by the Middle West Utilities Company have been completed, it was announced on June 17. The purchase price approximates $7,500,000. The sale is contingent on the securing of 55 per cent of the stock by the Middle West Company by July 15.

Letters will be mailed to every shareholder recommending the acceptance of the offer of $150 per share made by the Insull interests. There are 49,500 shares of stock scattered throughout New England.

Won't Allow Track Removal.—The Arkansas Railroad Commission has refused the petition of the Fort Smith Light & Traction Company, Fort Smith, Ark., to remove track from the city limits of Van Buren to the Falcon Zinc & Smelting Company's plant. The company has filed an appeal in the Circuit Court. It alleges that the operation of that part of the line should be discontinued on account of the increased use of the automobile.

Seeks Foreclosure and Receiver.—Suit to foreclose a mortgage on the Tiffin & Fostoria Railway and for appointment of a receiver was begun in Common Pleas Court at Tiffin, Ohio, recently by the Ohio Savings Bank & Trust Company, Toledo, acting as trustee for the bondholders. Several months ago the line was sold to the Toledo, Fostoria & Findlay Railway for $30,000 and that road is now operating the property. The latter company was made a party in this suit of bondholders.

Hearing Called on Abandonment Petition.—A hearing has been called at Buffalo, N. Y., before Public Service Commissioner Pooley on the petition of the Buffalo & Erie Railway for approval of abandonment of a portion of its route in Fredonia and the town of Pomfret, Chautauqua County.

Line Discontinued—The interurban operated between Albia and Hiteman by the Albia Light & Railway Company, Albia, Iowa, has discontinued service. The line was established in 1908. It has been operating at a loss for the last few years.

Files Abandonment Routes. — The Yonkers Railroad, Yonkers, N. Y., has filed a certificate in the office of the Secretary of State abandoning that portion of its route on Central Park Avenue, Walnut Street, McLean Avenue, Tuckahoe Road and Bronx River Road.

PROFIT AND LOSS

	1919	1920	1921	1922††	1923	1924
Gross earnings	$24,683,038	$28,986,228	$23,329,068	$13,184,771	$8,863,599	$8,360,035
Operating expenses	19,792,528	25,025,165	19,428,779	10,098,489	7,243,270	7,275,797
Net earnings	$4,890,510	$3,961,063	$3,900,289	$3,086,282	$1,620,328	$1,084,238
Other income	546,406	676,118	716,224	1,064,574	873,582	692,924
Gross income	$5,436,916	$4,637,181	$4,616,513	$4,150,856	$2,493,910	$1,777,163
Income from bonds	....	....	....	....	78,784	....
	$5,436,916	$4,637,181	$4,616,513	$4,150,856	$2,572,694	$1,777,162
Interest and taxes	2,868,250	3,003,606	3,351,068	2,222,981	1,630,264	1,625,778
Dividends	1,200,000	1,200,000	675,000	230,275	921,351	460,750
Depreciation reserve	950,000	400,000	400,000	250,000	....	....
Surplus	*$418,665	*$33,575	*$190,445	*$1,447,600	$21,079	†$309,366
Rate per cent earned	10.79	8.21	3.68	10.09	5.6	....

*After depreciation and taxes. †Deficit. ††City took over local Detroit lines May 15.

Southern Power & Light Sold.—Stockholders of the Southern Power & Light Company, meeting at Pine Bluff, Ark., on June 15, approved the merger of that company and its subsidiaries with the Electric Power & Light Corporation. The Southern Power & Light Company is the controlling corporation for the Couch-Longino properties in Arkansas, Louisiana and Mississippi. H. C. Couch continues as president of the Southern Power & Light and other companies in that group.

Will Abandon Service.—The Arkansas City-Winfield Northern Interurban Railway is to abandon its railway service between Arkansas City and Winfield, Kan., and in these cities. The line has been a losing proposition for some five years, despite efforts of the city to keep it going. The recent granting of a franchise to a bus company and the several truck and passenger lines operating between the towns have been instrumental in the company's failure.

May Abandon Valuation.—Valuation by the city of Winnipeg of the traction system of the Winnipeg Electric Company, Winnipeg, Man., may be abandoned as a way of keeping the proposed purchase out of the arbitration proceedings, should the ratepayers pass a by-law in favor of its acquisition. Following the arguments advanced by Alderman D. McLean, early in the proceedings with the company, that the city of Winnipeg had no course open but to accept for submission to the ratepayers the company's asking price for its tramway system if it wished to avoid arbitration the special committee now is considering cancellation of the analysis of valuation ordered three weeks ago.

Deficit for May in Toledo.—A deficit of $5,131 for May was reported by the Community Traction Company, Toledo. Operating expenses for May were $158,452, compared with $182,660 for a similar month a year ago. This cut was due to economies in operation. Passenger revenue was $286,904, compared with $297,482 last May. The deficit to the stabilizing fund is now $135,529 plus the original $400,000 in the fund. Car riding slumped compared with April. There were 131,027 revenue passengers per day on an average in May, 1925, compared with 138,348 in April and 148,708 in May last year. Total revenue passengers for the month were 4,061,842, compared with 4,609,937 in May, 1924.

May Receipts Show Gain.—The gross income of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for May was $394,729 in excess of the gross for May, 1924, under the four-tokens-for-a-quarter rate. The present temporary rate is 8 cents, two tokens for 15 cents. All lines carried 80,047,428 passengers in May, as against 81,288,979 pessengers in May, 1924. The report shows the surplus for the five months to be $518,232 and for the month of May $134,594. The total number of passengers carried in the five months was 385,949,131, of which surface, subway and "L" lines carried 384,743,150 and buses 1,205,981.

Personal Items

H. S. Robertson, Manager

Executive Long Familiar with Denver Problems Appointed to Operating Post

When Edward A. West resigned as general superintendent of the Denver Tramway, Denver, Col., to join the Utah Light & Traction Company, Salt Lake City, there was much speculation on the outside as to who would be selected to assume the varied duties he had so ably performed. On the inside, however, was Howard S. Robertson, to whom the other members of the board said:

"Mr. Robertson, you are thoroughly familiar with the policies of the company and as our general manager you will please direct us." That's how the vacancy was filled. Mr. Robertson certainly was familiar with the company's affairs. For about twelve years he has been secretary of the company, a member of the board of directors, and while not taking an active part in operating details he knew what had been going on. Because of this and his untiring devotion to duty his advancement to the general managership followed.

H. S. Robertson

On entering the general manager's office the representative of the ELECTRIC RAILWAY JOURNAL at Denver met a man of medium build, with iron gray hair, who acted according to what is generally understood to be "Southern hospitality." His reply to the inquiry for Mr. Robertson, "Why, that's me," seemed to pop out with a "Glad to see you" back of it, showing that a pleasing personality and ability had carried Howard Robertson forward to the position he occupies.

This man who has worked so silently for so many years at Denver as to escape the attention of practically all but his friends and immediate associates was born in Cheyenne, Wyo., on May 23, 1878. When he was only three years of age the family moved to Denver and he has been there ever since. After finishing in the public schools, he was graduated from West Denver high school, and in due time walked from the University of Colorado's law school carrying his sheepskin. This was in 1901. He lost no time in having a gold lettered sign printed, but went right to work in the claim department of the Denver Tramway. Two years later he joined the legal department as an assistant to C. J. Hughes, Jr., the general counsel. In 1908 he was appointed general attorney, serving with Gerald Hughes, who had succeeded his father as general counsel.

If Mr. Robertson has an avocation it is hiking. He has never been known to neglect business to go on a hike; neither has he been known to neglect an opportunity to relax when a respite from business has been earned.

J. J. Doyle Heads Washington-Baltimore Interurban

George T. Bishop, president of the Washington, Baltimore & Annapolis Railroad, Washington, D. C., for the last twenty years, becomes chairman of the board of directors; J. J. Doyle, formerly vice-president and general manager, becomes president; George Weems Williams, first-vice-president and general counsel; Thomas P. Littlepage, second vice-president and secretary, and Harry T. Connolly, general manager.

The changes are due to the desire of Mr. Bishop to be relieved of the more active duties of that office.

The new president, Mr. Doyle, has resided at Baltimore for nearly twenty years and has been connected with the company in various capacities for that period. Mr. Connolly, the new general manager, was born and reared in Baltimore and was manager of utilities at Annapolis until his appointment as assistant general manager.

Ernest Stenger Heads New Denver Company

Ernest Stenger will head the successor to the Denver Tramway as president under the reorganization. Mr. Stenger has been receiver under Judge Lewis. He was elected president of the Denver Tramway in 1920, a short time before it went into the hands of the receiver. Prior to taking over that position, he was superintendent of the southern division of the Union Pacific Railroad, with headquarters at Kansas City.

Glasgow Appointments Made

The Glasgow tramways committee has approved of proposals by the manager to appoint various members of his staff to take charge, under his direction, of certain sections of the department. The new appointments are: J. MacDonald, engineering (electrical); A. Gerrard, engineering (mechanical); J. Grierson, engineering (civil), and G. B. Masterton, engineering (construction). These changes have been rendered necessary through the resignation of George G. Braid, chief engineer of the department.

W. S. Hart Heads Canadian Association

William Stephen Hart, elected president of the Canadian Electric Railway Association at the recent meeting in Montreal, is an officer or a director in nearly all the many enterprises in Canada with which the Aldred interests are identified. He is treasurer and director of the Shawinigan Water & Power Company, treasurer and director of the Canada Carbide Company, Ltd., vice-president and treasurer and director of the Canadian Electro Products Company, Ltd., vice-president and director of the Continental Heat & Light Company, president and director of the Electric Service Corporation, managing director, treasurer and director of the Highway Lighthouse Company, Ltd., vice-president and director of the North Shore Power Company, treasurer and director of the Quebec Power Company, treasurer and director of the Quebec Railway, Light, Heat & Power Company, Ltd., vice-president and director of the Shawinigan Engineering Company, Ltd., treasurer and director of the St. Maurice Power Company, Ltd., vice-president and director of both the Shawinigan Falls Terminal Railway and the Three Rivers Traction Company.

W. S. Hart

This is an imposing array of offices. Still the incumbent of them has so far escaped the public limelight. His very accession to these posts means that he has done many unusual things, but they have been done so unostentatiously that leads have been difficult to secure and impossible to follow. This much is known. Mr. Hart is another American who has become one of Canada's empire builders. He was born in Foxborough, Mass., on June 1, 1878 and was educated at the Massachusetts Institute of Technology. He went to Canada from the United States in 1903. In that year this man of many corporate interests commenced with the Shawinigan Water & Power Company as an accountant. He was appointed secretary in 1906, treasurer in 1912 and a director in 1916.

Wisconsin Public Service Announces Change

J. C. Shade, who has been in charge of the railway department of the Wisconsin Public Service Corporation, Green Bay, Wis.; W. H. Sylvester, superintendent of railways, Manitowoc, and C. E. Borgnis, engineer maintenance of way, Green Bay, have tendered their resignations. George Biebel, superintendent of transportation, will look after the operation of the railway department at Green Bay; H. A. Zimdar, manager at Manitowoc, will take over Mr. Sylvester's duties, and Francis Daniell of the power department will look after the work heretofore in charge of Mr. Borgnis. All of these departments will operate under the general direction of Mr. Carson.

L. H. Breuer, Rolla, Mo., was recently reappointed chief counsel for the Missouri Public Service Commission by Gov. Samuel A. Baker.

J. Welling, permanent way engineer for the London County Council Tramways since 1901, is retiring. He will receive a pension of £504 a year.

H. McDavid, for the last seven years secretary and treasurer of the Hattiesburg Traction Company, Hattiesburg, Miss., recently purchased by the Mississippi Power Company, has been succeeded by E. E. Burkett, who has been general bookkeeper. Mr. McDavid will be superintendent of local operations in Gulfport, Miss., for the Mississippi Power Company.

Obituary

William Tichenor, claim agent of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., and president of the American Electric Railway Claims Association, 1914-1915, died at his home in Indianapolis on June 12. He was graduated from the University of Michigan and after the completion of his law studies he began the practice of law in Terre Haute. In 1905 he was made assistant attorney of the Indianapolis Traction & Terminal Company. After the merger which resulted in the formation of the Terre Haute, Indianapolis & Eastern Traction Company Mr. Tichenor was made claim agent of the company. This position he held up to the present time. He was very active in claims association work and before his election as president of that body was second vice-president and first vice-president.

F. Spencer, one of the pioneers of electric traction in England, died on May 16. He was an engineer in connection with the construction and operation of the Blackpool electric tramway, opened for traffic in 1885. After that Mr. Spencer held various tramway engineering and managing positions. One of his sons is C. J. Spencer, general manager of the Metropolitan Electric Tramways.

William Mainland, president of the Hannibal Railway & Electric Company, Hannibal, Mo., died on June 3 at his home in Oak Park, Ill. He was 66 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Sixty Buses Ordered for Kansas City

Francis M. Wilson and Fred W. Fleming, receivers for the Kansas City Railways, Kansas City, Mo., have practically completed all arrangements for the purchase of the buses which are to form the auxiliary transportation system. The first order, for 25 single-deck, 29-passenger street-car type buses, was awarded to the Yellow Coach Manufacturing Company, Chicago, on the night of June 10.

The receivers are buying only the chassis for the several types of buses from the bus manufacturers. Two St. Louis car companies are to build the bodies, the chassis being delivered at St. Louis rather than to Kansas City.

On the afternoon of June 11 Mr. Wilson, in order to get guaranteed delivery within a certain period, called the executive offices of the Six-Wheel Safeway Manufacturing Company, Philadelphia, on the long-distance telephone and ordered eighteen double-deck buses and five parlor cars from that company. Agreement was obtained to have all the double-deck buses delivered at the body manufacturers in St. Louis within 42 days and the five parlor car chassis within 49 days. The point on which the purchase of the six-wheel buses had hung fire was that of early deliveries. The agreement for the purchase of the six-wheel buses having been made orally between Mr. Wilson and the Philadelphia manufacturer's executives, the receivers signed the formal order the same day. The bodies for these will also be built in St. Louis.

On June 12 it was announced that two of the six-wheel chassis had been shipped on that day from Philadelphia to the body makers at St. Louis, to be used in making measurements for eighteen double-deck bodies and the five parlor car bodies. It also became known on that day that the Yellow Coach Company intended to make immediate shipment of a sample chassis to St. Louis to enable the body makers to start on the street-car type bodies.

The receivers also have arranged to purchase from the Mack Truck Company two standard-type buses for use on the feeder lines. The Mack company is also to furnish eleven chassis to be shipped to the body makers in St. Louis, but the two standard buses will be the first of the new system to be seen on Kansas City's streets. They are expected to arrive in July in time to be placed in service in accordance with the provisions of the franchise granted the railway in connection with the auxiliary bus lines.

It was announced on June 13 that the receivers had decided to fit six buses with gasoline-electric equipment for use on the 39th Street route. The pur-

ELECTRIC RAILWAY MATERIAL PRICES—June 16, 1925

Metals—New York

Copper, electrolytic, cents per lb.	13.75
Lead, cents per lb.	8.35
Nickel, cents per lb.	34.00
Zinc, cents per lb.	7.30
Tin, Straits, cents per lb.	56.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.275
Somerset mine run, Boston	1.975
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.775
Kansas screenings, Kansas City	2.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.375
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.50

Hardware—Pittsburgh

Wire nails, base per keg	2.7
Sheet iron (28 gage), cents per lb.	3.15
Sheet iron, galvanized (28 gage), cents per lb.	4.25
Galvanized barbed wire, cents per lb.	3.45
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.07
White lead in oil (100 lb. keg), cents per lb.	0.1575
Turpentine (bbl. lots), per gal.	1.02
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	15.50
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 4x8x4, f.o.b.	
Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.86
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.125
Light copper, cents per lb.	9.375
Heavy brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4.375
Lead, cents per lb. (heavy)	6.75
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	18.00
Rails (short), Chicago, gross ton	18.75
Rails. (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	9.25

chase of this equipment is contingent upon terms of maintenance offered by the electric company. The gasoline-electric equipment was tested on June 12, and found to be satisfactory to the receivers.

To prevent confusion about fares, buses on the 25-cent parlor car line to the Country Club district will be painted a dark blue, with the company's monogram in gold.

Fares on all other lines are to be 10 cents, with transfer privilege between street car and bus for an extra 3 cents.

The first feeder line is expected to be in operation on July 4. The single-deck buses are to arrive in August and September and the double-deck buses in October.

E. M. Howe Heads Gray Motor, Maker of Tilling-Stevens Buses

Following a recent meeting of the directors of the Gray Motor Corporation, Detroit, Mich., announcement was made of the election of Ernest M. Howe, widely-known British transportation expert, as president of the Gray organization.

Coincident with the election of Mr. Howe as president, Henry W. Burritt was made vice-president and treasurer and B. M. Schultz secretary. The new Gray directorate will consist of Paul Gray, O. J. Mulford, Fred J. Robinson, Frank Beall, Henry W. Burritt, Ernest M. Howe, David M. Brown, Hobart B. Hoyt, Benjamin S. Hanchett, Charles P. Norcross and Henry Melville.

The manufacture and sale of Gray cars will be continued and expanded, and in addition the Gray Motor Corporation will be the sole manufacturer in the United States for the Tilling-Stevens Corporation, maker of the Tilling-Stevens gasoline-electric bus.

The gasoline-electric bus as it will be produced by the Gray organization will be an American vehicle throughout, save only for the electrical equipment. It will embody the Tilling-Stevens electric drive and control.

Car Purchase Necessitates Power Equipment

The demand for increased power due to the contemplated addition of 130 new multiple-unit cars by the Pittsburgh Railways, Pittsburgh, Pa., has made necessary the purchase and installation of new power equipment by the Duquesne Light Company. These cars will be put into service in the fall. A large part of this new power equipment will be used in the installation of the first automatic railway substation on the Duquesne Light system.

This automatic substation will be located in Mount Oliver and will include a 2,000-kw. converter, transformer and automatic switching.

It is proposed to extend the present switching station at Penn and Swissvale Avenues, Wilkinsburg, so that two 2,000-kw. 600-volt converters with transformers and manual switching may be installed at Wilkinsburg. They will supply 600-volt direct-current power to the Pittsburgh Railways. The power equipment is being furnished by the Westinghouse Electric & Manufacturing Company.

Rolling Stock

Rockford & Interurban Railway, Rockford, Ill., has ordered three 20-passenger buses.

Pine Bluff Company, Pine Bluff, Ark., has received two new street cars of the Birney one-man safety type, with two-motor control and a capacity of 34 passengers. The cars were made by the American Car Company of St. Louis.

New Incorporation

Quincy & Northeast Electric Railway, Quincy, Ill., recently filed papers of incorporation with the Recorder of Deeds at Quincy, Ill. The proposed line would run from Quincy to Monmouth, Ill., through Adams, Hancock, Henderson and Warren Counties. The articles of incorporation list the capital at $1,200,000 and authorize the use of steam, electricity or other motive power.

Track and Line

Illinois Traction System, Peoria, Ill., has acquired property in Madison, Ill., needed to eliminate a sharp curve in the tracks at Second and Madison Avenue, recently taken over from the Alton, Granite & St. Louis Traction Company. Two parcels of land purchased cost $54,000 while labor and material will bring the total expenditure for the improvement to $75,000.

Winnipeg Electric Company, Winnipeg, Man., recently completed the laying of 4,400 ft. of second track on St. Mary's Road, Winnipeg, from McMillan Street to St. Anne's Road. It is open-track construction.

Toronto Transportation Commission, Toronto, Canada, was authorized by a resolution of the York Township Council to construct and lay down railway tracks to complete the Rogers Road line to Bicknell Avenue, as outlined in the Toronto Transportation Commission report, which revises the estimate for the cost of this work from the tentative estimate last year of $350,000 to $329,000.

New York & Queens County Railway, New York, N. Y., has started the double-tracking of the line operating between Jamaica and Flushing. There is a total of 14,547 ft. of single track between Flushing and Jamaica. It is expected that half of this will be double tracked during the summer. The work, under the direction of Receiver Andrews, has been necessitated by a growth in population in this territory and by the anticipated growth in traffic when the subway between New York and Flushing is put into operation.

Portland Electric Power Company, Portland, Ore., is to expend $17,000 extra in trackage in order to extend its lines on the new St. John's section over a route that will be more nearly in the interests of safety. F. I. Fuller, vice-president, stated to the City Council that the company would be willing to do this if it was relieved of the cost of paving between and alongside its new tracks.

Intercity Terminal Railway, North Little Rock, Ark., has completed the 1-mile extension over East Second St.

British Columbia Electric Railway, Vancouver, B. C., will soon install additional track facilities on the Sasamat line, together with electric signals for single-track operation. Plans are being prepared for double-tracking 41st Avenue from Granville to East Boulevard and will be submitted soon to the Point Grey authorities for approval.

Trade Notes

Continuous Transit Company, New York, N. Y., at a recent directors' meeting decided that the New York office should be discontinued some time during the last week in June. All future communications with reference to the moving platform should be addressed in care of Thomas Drever, president of the Wahl Company, 1800 Roscoe Street, Chicago.

Timken Roller Bearing Company, Canton, Ohio, announces the retirement of Heman Ely, vice-president and treasurer. Mr. Ely became associated with the Timken company in 1909 as secretary and in 1916 was also appointed treasurer. He became vice-president and treasurer in 1920. H. J. Porter, who has been general sales manager, is advanced to vice-president in charge of sales. L. M. Klinedinst, heretofore assistant to Mr. Porter, becomes general sales manager of the industrial division.

Charles N. Ring, until recently works manager of the Allied Steel Castings Company, Harvey, Ill., has been appointed assistant director of the Electric Steel Founders' Research Group, succeeding W. J. Corbett, who has resigned to become secretary-manager of the Steel Founders' Society of America.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., recently had a convention of its sales representatives, gathered from all parts of the United States. At the conclusion of the conference F. O. Bailey, sales manager, gave a luncheon at the Whitehall Club, at which were present E. E. Gold, president, and E. B. Wilson, vice-president, and the sales force. Subsequently the representatives and their wives were entertained at Coney Island by Mr. Bailey.

Timken-Detroit Axle Company, Detroit, Mich., has announced that P. W. Sloan, who has been service engineer in charge of the field service men, has been appointed service manager. Mr. Sloan has been connected with the Timken organization for a number of years.

New Advertising Literature

Steel Sales Corporation, Chicago, Ill., has issued "The Welder's Guide," a 44-page reference work "for the man who is actually welding."

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 335 on steel bars.

Herman H. Sticht & Company, New York, N. Y., have issued a bulletin, No. 130, describing two types of the Model "D" Standco megohms.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, June 27, 1925 *Number* 26

Obsolete Equipment Affects Public Opinion

IN A PAPER before the annual summer meeting of the Central Electric Railway Association at French Lick, Ind., Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL, suggested that the element of style should be given serious consideration in judging the ride-merchandising value of street car designs.

This opens a progressive line of thought. If stylish, rakish and attractive looking cars create an instinctive desire to ride, then it follows that aged, old-fashioned looking equipment tends to limit riding to those who are forced to use the cars by lack of other facilities.

But obsolete equipment does even more harm than that. It creates a popular impression that the very industry itself is obsolete. It causes people to believe that the development of car design for rail operation is at a standstill. It leads them readily to accept the idea that transportation by rail in city streets is itself an obsolete mode of travel.

This impression is further stimulated by contrast with the automotive vehicle—both private cars and buses. People have seen the automotive vehicle radically improved in a very few years. They have come to have confidence in the ability and progressiveness of automotive designers and manufacturers. They tend, therefore, to accept readily the opinions advanced by the occasional enthusiast who predicts the doom of the rail-borne electric car.

To overcome this easily spread idea, they must be given more information about the place of the street and interurban car in the modern scheme of transportation. Publicity is essential in accomplishing this. But no amount of publicity can overcome the unpopularity created by awkward, cumbersome, heavy and noisy cars in the streets. To overcome the impression that the electric railway is a back number it is essential that every effort be expended toward the retirement of obsolete looking equipment.

Every Man a Salesman for the Service

COMPLETE as it was, the brief of the Northrn Texas Traction Company, Fort Worth, Tex., that won for it the Coffin prize did not exhaust the subject of selling service so far as that company was concerned. This was strikingly instanced at a recent weekly staff meeting attended by one of the editors of this paper. The proccedings were particularly interesting because the program consisted largely of subjects which had been laid out at a previous meeting, before any one even knew that a visitor was to be in town and attend.

The session lasted about three hours. Every subject discussed had something to do with the sale of rides. Running through a number of subjects, from car painting to the posting of car stop signs, every item taken up at that meeting was discussed from the angle of building more car rides.

In connection with one particular merchandising campaign which was in preparation, a number of suitable, attractive slogans were desired. Every man at that meeting was called on to read a list of slogans which he had prepared. These lists included many good slogans; some were not so good. All of them were frankly criticised, and many suggestions were developed from the criticism.

Entirely aside from the question of the availability of the slogans, every man in that meeting was thinking about the sale of transportation. Unquestionably, each man took back with him to his own department a keener realization that transportation is a service which can and must be merchandised and that the work of every department, from mechanical to claims, should be carried on with the one common object of selling more car rides.

The name of the property has been mentioned in this discussion not with a desire to pat the officials on the back. They don't need it. The meeting described does, however, illustrate one of the ways in which the coveted Coffin honor was won by this comparatively small property way down in Texas. Other traffic sales methods used by the company are described elsewhere in this issue. In exact proportion to the degree in which this need for merchandising the service is being recognized and turned to advantage may the electric railway of today expect to succeed in converting automobilists and pedestrians into car riders.

Receivers Race to Forestall Default

QUICK work has been done in devising the plan for the readjustment of the finances of the Detroit United Railway. There was need for quick work. The sum of $250,000 is required by July 1 to avoid default in the sinking fund payment. The plan now put forward, if approved, will meet this demand. In financial parlance it is a readjustment, not a financial reorganization, that is proposed. Foreclosure and reorganization will follow only if the plan now presented to the stockholders and the creditors is not approved by them, but this appears unlikely. So far there has been no default in the payment of interest or in meeting the sinking fund requirements. The race by the receivers is to forestall such contingency.

It is up to the stockholders. They are being asked to put in an additional $6,150,000. The assessment they are called upon to meet by July 1 is 40 per cent. For the new money they will get new general mortgage bonds which will become a first lien in 1929. Creditors are being asked to accept the same security. Their choice is between subscribing to the plan and trying to protect themselves if the property of the company should have to be disposed of at forced sale. Of the many noteworthy aspects of the new plan, the one calling for a change in the conditions surrounding the stock deserves attention. There is only one issue now—all common. Preferred stock and two classes of common stock are proposed. Ultimately, one of these issues of common stock may prove to be quite valuable. The very slim equity behind it at the inception of the plan ranks it as highly speculative, but if the plan works out financially as the operating managers anticipate that very slim equity may result in its eventually becoming very valuable.

The plan was published in the ELECTRIC RAILWAY JOURNAL for June 20 in detail sufficient to permit it to be interpreted intelligently. The engineers for the property estimate a balance available for the coming year of $697,288, presaged on the adoption of the plan and the assumption that an increase in rates will be permitted. This permission is now being sought. Rates are inordinately low. Competition, now partly overcome, appeared to dictate a rate policy which has turned out to be a tactical error.

So far as the plans ahead for the property have been divulged they contemplate no radical change from the program laid down previous to the receivership. Contingent upon the approval of the plan at the meeting on June 29 the program will be carried forward rigorously to fulfillment. If the conditions that beset the Detroit United were peculiar to that property the need would not exist for extended comment, but such is not the case. For this reason the readjustment plan, contemplating as it does a raise in rates, greater use of the bus, further articulation of railway and bus and more intensive cultivation of business, are of more than academic interest. Fundamentally the program is sound. Time alone will write the final appraisal on the sagacity displayed in carrying out the moves that are contemplated.

"Excelsior" Is a Poor Watchword for the Architect

PITTSBURGH is conducting an enthusiastic drive to secure funds for the erection of a "cathedral of learning." No one will deny that an increase in its educational facilities is likely to be advantageous to that or any other city. One feature of the proposed plan, however, may well arouse grave misgivings. To raise the edifice housing this university high above all other structures round about—and there are already many tall buildings in Pittsburgh—would be a serious mistake from several points of view.

Whether the skyscraper is a type of architecture that will produce a convenient and suitable home for an institution of learning is a question that may well be left to the educators. The apparent indorsement of the many-storied building by its selection for this use, however, might have far-reaching effects of a most unfortunate kind. This phase of the matter is one that concerns every one interested in orderly, well-planned civic development, in which class nearly all transportation men will be found.

Outside of such large cities as New York, Chicago and Philadelphia even the transportation men themselves, perhaps, do not fully realize the evils of the skyscraper. Concentration of enormous numbers of people on a small ground area presents a transit problem that is beyond the possibility of efficient and economical solution with the facilities now available.

Many other valid objections can be raised against the extremely tall building, but the congestion thereby created is alone enough to condemn it. Few dissenting voices will be heard among those people in the larger cities who suffer daily from this cause. Yet the small towns continue to yearn for taller and taller buildings. It is to be hoped that Pittsburgh will not add impetus to this worship of false gods by building a cathedral of learning in the shape of a towering skyscraper.

Trunk Lines Embark in Operation of Buses

BUSES are to be operated by the New York, New Haven & Hartford Railroad within the territory served by its lines. For this purpose a subsidiary with a capital of $1,000,000 has been organized. The step is significant. In this respect the New Haven is aligning itself with the Boston & Maine Railroad with similar plans for bus development in northern New England. Other railroads, including the Great Northern and the Chicago, Milwaukee & St. Paul Railroad, have also recently announced plans for operating buses.

Some such bus policy is inevitable on the part of the large steam railroads. The same reasons apply that compelled electric railways to install bus lines in city and interurban service. It is obvious that, by and large, the existing transportation system can furnish much more satisfactory service than can the independent, particularly in substantially parallel service. Two dissimilar lines under the same management permit one to be used as a complement to the other to reduce duplication of service. Particularly significant was the confession by the New Haven Railroad in its official statement of the character of some of the circuitous runs now necessary by train. Here especially does the railroad contemplate the use of the bus. This is wise.

So long as the states continue to spend vast sums on the construction and maintenance of improved highways, which can be used by the motor common carrier at little or no greater cost than by the private user, the number of bus and motor carriers is bound to increase. This does not mean that the automobile is a more comfortable or efficient means of transportation than is the steam-drawn train. But it does mean that for certain classes of service—as with sparse traffic—it can be operated successfully and perhaps can be used in other lines also to advantage.

The danger is always inherent of overestimating the earning and strategic value of new forms of transportation. If the steam railroads do not, in connection with bus operation, repeat mistakes of the past, they will benefit, as will also the territories which they serve. They should "make haste slowly" and go forward intelligently. Entirely aside from the many injustices in the present situation—and there are grave regulatory and other injustices—that work a temporary advantage in favor of the bus, the doom of the rural train made up of one locomotive, one baggage car and one combination smoker and passenger coach, all of the vintage of 1895 operated once a day in either direction, was sounded a long while ago. The wonder is that the steam railroads were so long in discovering it.

Car Riding Increased 28 per Cent

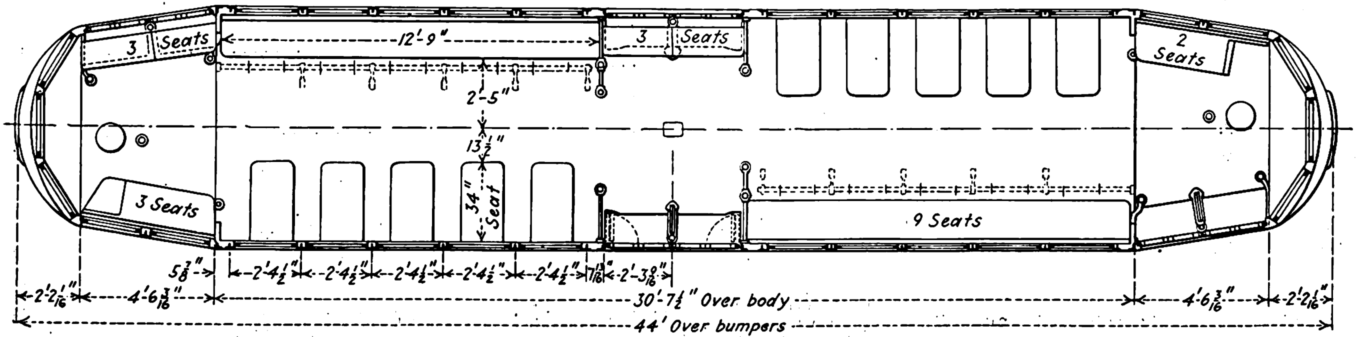
New Brooklyn Cars Increase Schedule Speed Due to Better Acceleration and Retardation and Decreased Loading Time — Lesser Weight and Better Schedules Reduce Energy Consumption—Other Features Are Incorporated in Last Cars Delivered

GATES
RIDGEWOOD
GATES
ENTRANCE
Entrance at the Front and Exit at Center Separate Flow of Traffic and Reduce Time Consumed in Stops

SERVICE requirements and operating conditions in Brooklyn are changing continually. The opening up of a new subway line or the extension of express service on one of the rapid transit lines affects travel on the various surface lines. This is shown sometimes by shifting of travel from one line to another, sometimes by a decrease and sometimes by an increase in the riding. It also affects the load in regard to the direction that people travel. An analysis of operating economies and changes which can be definitely attributed to the new cars of the Brooklyn City Railroad is therefore quite difficult, but by making an analysis on lines which are least affected by other conditions many economies are found to have resulted from the use of the new cars. These include increases in scheduled speeds, decreases in length of stops, and increased riding on the lines immediately after the introduction of this particular type of car. The last order for 335 cars was placed in November, 1924. Of these, 150 were built by the J. G. Brill Company, 100 by the St. Louis Car Company and 85 by the Osgood-Bradley Car Company. These cars, together with the 200 cars purchased in 1923, make a total of 535 double-end and pay-as-you-pass cars of this type ordered for Brooklyn service. Cars purchased on the first orders were described in ELECTRIC RAILWAY JOURNAL for Oct. 27, 1923, page 739. The last orders are for cars of the same general exterior appearance, and of essentially the same construction. However, there are a number of changes which are of particular interest, such as staggered seating, replaceable vestibules, power cables inside car, and rearranged barriers for controlling passenger movement. These have been found necessary by close study of the operation of the first cars.

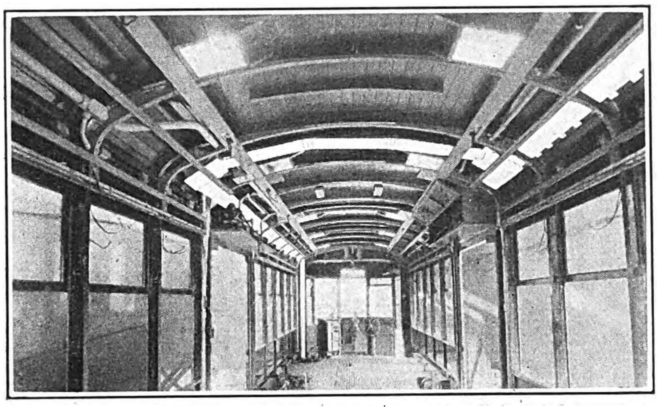
Previous to the ordering of the first cars, an extended survey was made to determine factors which would influence the type of car to be bought. The large variation in the number of passengers carried during rush periods as compared with non-rush periods and also the variation on different lines of the system showed that it was advisable to have a car which could be arranged for either one-man or two-man operation. The pay-as-you-pass car, with entrance at the front and exit at the center, was decided upon as a result of a survey made to determine where people stood on the sidewalks at corners while waiting for a car. This showed that at most intersecting streets, at which there are near-side stops, passengers will wait at a point in line with the building line of the street, and a check of various types of cars in service showed that many people were walking the full length of a car after it had stopped in order to board it.

The theory that this type of car used in connection with near-side stops in Brooklyn would reduce the length of stop required for loading a certain number of



Staggered Seating Arrangement Gives Aisle Width of 3 Ft. 6½ In.

passengers has been borne out by surveys made on lines immediately after the new cars were placed in service. On the Flatbush Avenue line, the average duration of stop was decreased from eight seconds to 6.2 seconds through the use of the new cars. Comparison was made for the month of December previous to the introduction of the new cars into service with the December following the use of the cars. This showed that the schedule speed on the Flatbush Avenue line increased from 9.25 m.p.h. to 9.9 m.p.h. At the same time, the number of stops per mile made by the cars has increased from 8 to 10. This increased operating scheduled speed has resulted from several other factors which are features of the new car design. The average acceleration of the new cars is 1.7 m.p.h.p.s. as compared with 1.5 m.p.h.p.s. for cars previously used. The average rate of retardation under all conditions of loading was increased from 1.52 to 1.73 m.p.h.p.s. This increased braking rate is made possible through use of the empty and load brake on these cars. This provides for automatic adjustment of the braking pressure in proportion to the load carried by the car so that a uniform braking rate is obtained regardless of the load. On cars without this device braking pressure is set at the maximum which will not cause slipping of the wheels with an empty car and the rate of retardation decreases as the passenger load increases. The average braking rate for a loaded car is thus reduced over what is obtained with automatic adjustment.



Main Power Circuits Are Installed in Metal Ducts Inside

Running Time Reduced Four to Seven Minutes

The beneficial effect of increased acceleration and retardation and decreased length of stop has resulted in a reduction in running time of from four to seven minutes on lines which have been equipped with the new cars. These lines vary in length from 6 to 8 miles. The number of passengers has increased rapidly with the use of new cars. Shorter headways have been necessary in some cases to care for the additional business, so that the reduction in running time has not permitted the removal of cars from service. The layover at the end of the line also has not been changed. The standard practice in Brooklyn is to provide a layover equal to the headway if this is less than four minutes, the maximum layover allowed.

The operating features of the cars just referred to together with the reduction in weight have also produced economies in energy consumption. These cars, averaging 21 tons each, give a reduction in weight of about 5 tons per car over previous equipment. Since service was started with new cars on the Gates Avenue line, there has been a reduction of four minutes in the power-on period per hour or from 23.2 minutes to 19.2 minutes. This has resulted in a reduction of 6.73 per cent in the power-on period for all cars on the line. Cars in Brooklyn are equipped with Arthur power saving recorders, so that accurate comparison of whole power-on periods can be made. The energy consumption for the new type of cars on representative lines is approximately 3.1 kw.-hr. per car-mile.

Large Increase in Riding

The increase in car riding is shown by comparison of the passengers carried on the Flatbush Avenue line and on the Richmond Hill line for December previous to the use of the cars with the month of December after the cars were placed in service. The Flatbush Avenue line was entirely equipped with the new type of cars and 80 per cent of the service on the Richmond Hill line was given with the new equipment. These particular lines are taken for comparison as the passengers carried were not influenced by other varying conditions to the extent that occurs on some lines. The Flatbush Avenue line shows an increase of 401,965 passengers and the Richmond Hill line an increase of 221,825 passengers. The combined increase for these two lines is 28.2 per cent.

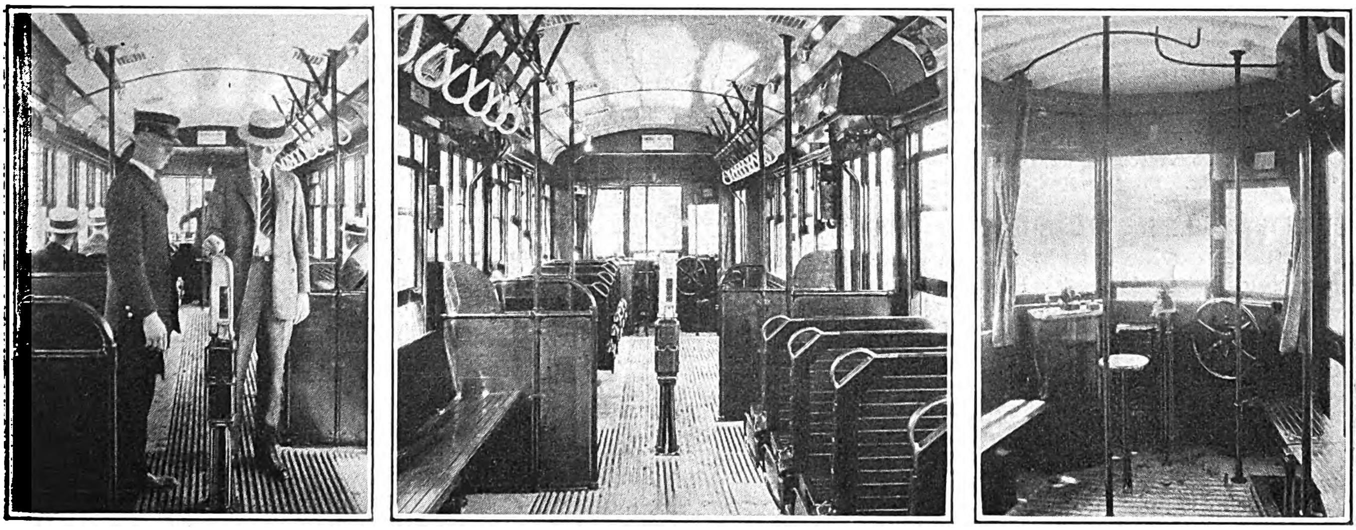
Of course, it is to be expected that maintenance costs will be decreased while the cars are new, but certain other economies in maintenance cost will result through the reduction in the number of trucks and motors required for this type of car over types previously used. Thus, considering a comparison on a seat basis, the 334 cars purchased on the last orders will replace 371 cars of older type. The same number of seats will thus be provided with 37 less cars, and there will be 74 less trucks and 148 less motors to maintain. The number of extra cars needed at the present time to take care of cars withheld from service for repairs, cleaning, etc., is about 4 per cent of the total. General overhauling

DIMENSIONS, WEIGHTS AND EQUIPMENT OF NEW BROOKLYN CARS

Number of cars ordered	335
Date order was placed	November, 1924
Date of delivery	June, 1925
Builder of car body	The J. G. Brill Co., St. Louis Car Co. and Osgood Bradley Car Co.
Type of car	Closed motor, one-man, two-man
Seating capacity	50
Weight, total	42,000 lb.
Bolster centers, length	21 ft. 6 in.
Length over all	44 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft., $9\frac{13}{16}$ in.
Body	Steel
Interior trim	Cherry, stained magogany
Headlining	Agasote and Nevasplit
Roof	Arch
Air brakes	Safety Car Devices Co. with variable load brake
Anti-climbers	Hedley
Axles	Carnegie heat treated steel
Car buzzer system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	Oil retaining type center bearings; special plain side bearings
Conduits and junction boxes	Pressed steel duct with aluminum junction boxes
Control	General Electric K-72A
Curtain fixtures	Acme and National
Curtain material	DuPont Fabrikoid
Destination signs	Hunter
Door operating mechanism	Consolidated and National Pneumatic
Enamel	Devoe & Raynolds
Energy saving device	Arthur
Fare boxes	Johnson, type J
Fenders or wheelguards	Root automatic
Gears and pinions	Nuttall BP
Hand brakes	Peacock staffless
Heater equipment	Gold Car Heating Co.
Headlights	Ohio Brass, Brooklyn type ZP
Journal boxes	Brill and St. Louis
Lightning arresters	Type MP
Motors	Four Westinghouse 510-A, inside hung
Registers	International
Sanders	Ohio Brass
Sash fixtures	Dayton Manufacturing Co.
Seats	Cherry, slat type
Slack adjuster	Westinghouse, type J
Step treads	Feralun
Trolley catchers	Ohio Brass, self-oiling
Trolley base	Ohio Brass Form 1
Trolley wheels	Columbia
Trucks	Brill and St. Louis
Ventilators	Railway Utility
Wheels	Standard Steel, 26 in. diameter

of the first cars purchased will start this fall, and at that time the spares will have to be increased to approximately 10 per cent. But even with this, the number of extra equipments required will be reduced from approximately 20 per cent to 10 per cent.

Another saving has resulted from the use of Johnson type J coin boxes, together with solenoid-operated registers. The fare collection and registering equipment was described in ELECTRIC RAILWAY JOURNAL for Oct. 27, 1923, page 747. The increase in passenger receipts with the new type of coin switch over that when using the older type of fare box was found to be approximately 4 per cent. In speaking of the reason for this saving, C. E. Morgan, vice-president and general manager of the railroad, said that he believes it is due largely to the increased opportunity given conductors to inspect individual coins in the fare box. With this type of equipment, the passenger places the coin in a slot and after it is registered it is exposed to the view of the conductor. Since each individual fare is deposited and is brought to view separately, the operator has a better chance to detect fraudulent practices than would be the case with several coins in a heap in the fare box.



At Left—Each Individual Fare Is Deposited and Brought to View Separately. In Center—The Inside Gives a Pleasing, Roomy Impression. At Right—Rear-End Seating Arrangement Provides a Comfortable Nook

The new cars are being painted with the same type of spider-web design on the dashers to distinguish the new cars from the old equipment that was used on the previous lot. Comments received from the public regarding this feature show that it has been of material assistance in advertising that new cars were being placed in service, and that these cars have increased advantages and riding comfort over the older equipment.

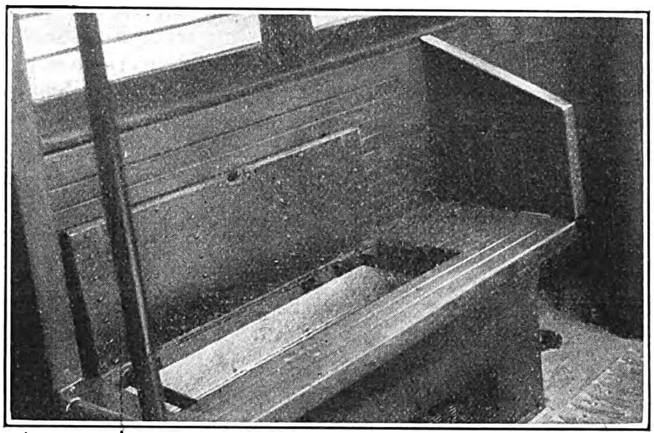
MINOR CHANGES IN THE NEW CARS

The width of the cars now being delivered has been increased 1 in. over the previous ones. Other dimensions are the same. Particular attention has been given to provide the maximum space possible in the cars. Due to operating clearances, cars in Brooklyn are necessarily limited in width. The new cars, with a width of 8 ft. 4 in., however, are but ½ in. narrower between the glass of the windows than the 5100 series of cars operated by this company, which are 2 in. wider over all. In order to move the window sash out as far as possible, a special construction is used for the side body posts. These consist of 1½-in. x 1½-in. x 3/16-in. rolled tees which extend from side sill angles to the top rail. A wood filler is placed on the inside of the tee and a formed sheet steel strip on the outside is bent down along the sides of the wood filler, to which it is bolted. The sash fits against these metal strips, which are welded to the window sill in order to keep out water.

Operation of the first order of cars showed that a wider aisle and additional space for standing passengers was very desirable. To provide for these, the last orders of cars have a staggered seating, with cross seats on one side of the car and a longitudinal seat opposite. This gives an aisle width of 3 ft. 6½ in. The seating capacity of 50 passengers remains the same. The arrangement of folding seats for the vestibules and at center doors of cars is the same. The Davis book type of folding seat has proved very satisfactory. It provides a seat length of 4 ft. 7 in. with both end and center supports and does away with the disagreeable feature of having a stanchion in the center of the seat which would limit the number of passengers which could occupy the space. This type of seat also prevents the danger and annoyance from folding supports being placed improperly which might result in the seat falling down while in service.

Some changes have been made in the arrangement of the stanchions and barriers at the center of the car. With the pay-as-you-pass system of fare collection, passengers going from the front or unpaid to the rear or pay section will ordinarily pass to the right of the conductor, while those in the front section who desire to alight will pass to the left. In the original design as installed on the cars, there were four upright stanchions extending from the floor to the roof in line with the aisle side of the cross seats. On the new cars these stanchions have been moved back approximately 10 in. toward the side of the car. The barrier on the left as a passenger goes from the front section to the exit extends out from the vertical stanchion and has a pipe railing at the top. By this arrangement, it is necessary for passengers to pass adjacent to the conductor. At the same time additional room is provided above the passengers' waists. This gives additional space for their elbows and arms, and also improves the inside appearance of the car since there is less obstruction to vision from one end to the other. All pipe stanchions and railings are of 1-in. wrought-iron pipe. All flanges for stanchions are recessed so that they are flush with the floor. Stanchions are painted green with two coats of Lucas stanchion enamel covered with hard drying varnish. The floor mat at the center of the car also has had additional crosswise grooves added so as to facilitate drainage to the sides.

The window guards consist of six horizontal rods held by supports at each window post. These set into sockets in retaining castings. In order to prevent rattling and provide a tight fit, the center part of the supporting frame is beveled outward slightly, and a beveled casting on the window post fits tightly against this. Downward movement of the guards forces these two beveled surfaces together and prevents all looseness. The window guards are arranged in five sections for each side, two sections covering three windows each and three sections covering two windows each. They are hinged at the bottom and are arranged so as to drop down for cleaning the windows.



There Are No Corners or Ledges for Collection of Sand in Sand Box Opening. Electric Heater in Seat Keeps Sand Dry

VESTIBULE ENDS ARE DEMOUNTABLE

A new feature of these cars is the construction of the ends of the vestibules ahead of the doors as separate units. This is to provide for easy removal and replacement in case of damage from collision in street traffic. Each vestibule has a double hood plate with the lower or sub-hood plate extending between the vestibule corner posts. This is securely bolted to the upper or main hood plate with the bolts readily accessible. The vestibule corner posts are made of wood in two pieces, bolted together. The forward part of each corner post and the two center vestibule posts are tenoned into the sub-hood plate only, while the rear parts of the corner posts are tenoned into the main hood plate only. Pocket castings bolted to the crownpiece are provided for the bottoms of all vestibule posts. The entire vestibule front is a separate unit made interchangeable for all cars of the series. Separate units can thus be kept on hand for replacement. The front section of the vestibule can be removed and a new one put in place in less than three hours. To dismount a vestibule, the equipment at the dasher must be disconnected. This includes the controller, brake valve, hand brake, etc. On the outside the dasher sheets and bumper shields must be removed. Removable sheets on the inside give access to the various bolts for disconnecting. In its normal position, the demountable section is supported on spacing blocks. After the bolts are disconnected, these spacing blocks are taken out, allowing the vestibule to drop down ¾ in. This gives clearance so that the section can then be swung outward and removed.

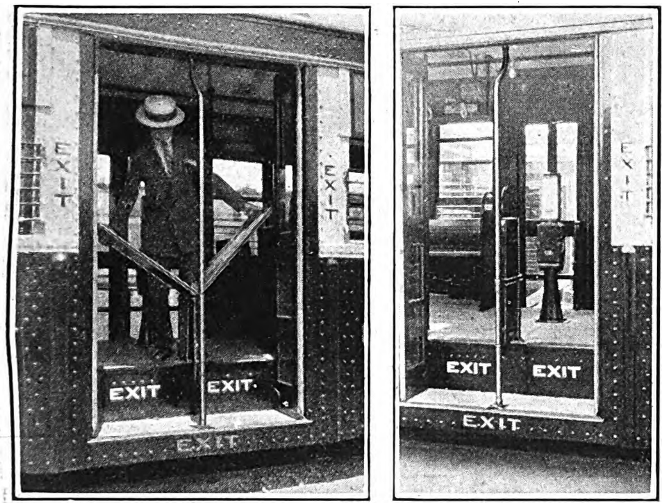
Cabinets Are Provided for Auxiliary Circuit Switches and Fuses and for Door Engines

A fireproof compartment constructed of No. 18 gage sheet steel suitably lined with transite is provided at the No. 1 end for the switches and fuses controlling auxiliary circuits. The covers for the compartment are hinged at the top and latched at the bottom with Howard swing sash latches. Openings in the compartment provide for various wiring conduits. All switches are of quick-break blade type and these, together with the fuses, are mounted on a slate base. On the side opposite the switchboard cabinet, and over the entrance doors, is another cabinet for the door engine.

TIME SAVED BY TABLES OF DESTINATION SIGNS

Another feature of these cars is a table of numbered destination sign readings for convenience of the operator in turning the Hunter destination sign from one reading to another. The wording of each sign, together with a serial number, is stenciled on the back, so that these can be read conveniently by the operator when he lifts the cover. A table of the sign readings arranged alphabetically with the corresponding sign numbers is placed on glass by the decalcomania process. This table is placed in a metal holder at the back of the sign box. In order to shift a sign from one designation to another, the operator finds the number for the sign designation to which he wishes to turn the sign, then by lifting the cover and observing the number of the sign designation in place, he will know which way to turn the sign and how far in order to reach the required designation. This arrangement saves time and trouble of operators at terminals and is of particular value at points where there is no layover to allow time for it.

A change has also been made in the method of running the car cables and installing car wiring on the latest cars. The main train line cable between controllers on the first cars was installed in a 2-in. conduit running the entire length of the car body. On the new cars a junction box is installed underneath each controller. From this two 2-in. conduits run to the end sill, which is of open construction and serves as a junction box. The junction boxes underneath the controllers have covers at the bottom and front end, and the end sill has a cover for the bottom and the side toward the car body. This permits a straight pull of the cable from the junction box to the end sill and with the arrangement of covers there is ample space for pulling in wires. From the end sill motor cables are run in two 1¼-in. conduits. The wires between controllers and for the resistance leads cross over to the corner of the car through the end sill, go [illegible] the corner posts and back of the advertising sign racks to the center doors of the car, where they cross above the headlining. All this wire is run in metal duct. Aluminum junction boxes are installed at each corner. Two junction boxes are installed at the center, one for the resistor lead splices and one for the main cable leads. The resistor cables are made up at the bench and are installed complete. All junction boxes are of aluminum to reduce weight. By installing the main car cable inside the car, additional space is given underneath for a better arrangement of the equipment installed underneath the car body.



At Left—Placing a Folding Book Type Seat in Position for Passengers. At Right—The Folding Seat Forms a Barrier to Divide Streams of Passengers Coming from Opposite Ends of Car

In the new cars the number of sand boxes was reduced from four to two and these are installed underneath the longitudinal seat in each vestibule instead of underneath longitudinal seats at each corner of the car body. The boxes are lined with No. 22 gage galvanized iron and the top has a removable screen. Particular attention has been given in the design of the opening underneath the seat so that there are no projecting edges on which sand might lodge, so as to prevent closing down of the seat and loosening of hinges. The seat which forms a cover for the box is supported on two cross irons which have sharp edges and there are no supports at the ends or corners. A 1¼-in. steel discharge pipe which runs to a position 6 in from the rail is provided for each sand box. Particular attention is given to sealing the connection from the sand box to the pipe, so that water cannot enter. An electric heater under the seat with the sand box keeps the sand dry and prevents freezing in winter weather.

A change has been made in the method of attaching the coin box to the fare box stand. With this system of fare collection, the conductor changes his location from one side in the middle of the car to the other when the motorman changes ends. This requires the turning of the coin box 180 deg. Originally, it was necessary to unlock the box in order to turn it. With the new construction the contacts are made automatically so that the box can be rotated. If it is removed, the contacts are forced out of position, which disconnects them from the circuit. Other changes in the new cars include the use of a 14-in. gong, which gives a louder and clearer tone; installation of the heat regulator underneath one of the longitudinal seats instead of overhead on the platform, use of a heavier casting for the emergency drawbar and reinforcing castings where the vestibules join the car body.

The detailed specifications of the new cars are given in the table on page 1004.

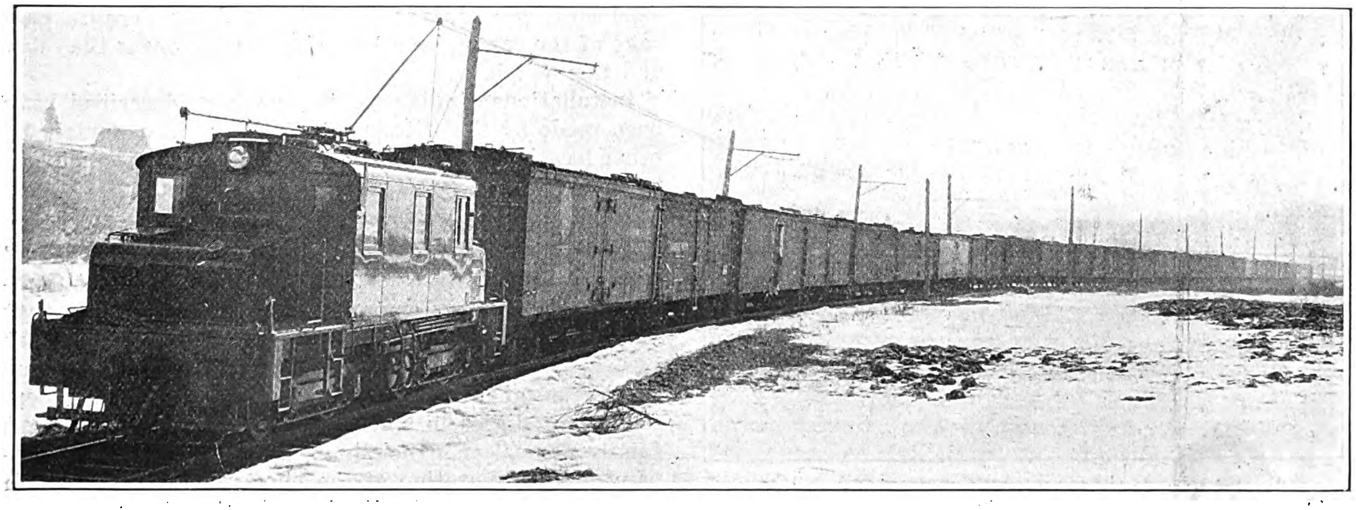
Handling Freight on Aroostook Valley Line

New 60-Ton Electric Locomotive Recently Built for This Service Has Interesting Features—Severe Winter Weather Presents an Operating Problem

During the year 1923-24 the Aroostook Valley Railroad, Presque Isle, Me., handled 3,746 cars of potatoes, averaging 675 bushels per car. Thus, at 20 lb. per bushel, the average car weight was 20¼ tons. At the same time 900 cars of inbound freight were received and distributed, most of which was fertilizer. The management considers that the road hauls one carload of fertilizer to every ten cars of potatoes. The railroad also handles a considerable amount of other freight, consisting of coal and general merchandise.

Weather conditions during the larger part of the year are very severe in this part of Maine. There is much snow and temperatures ranging between 25 and 35 deg. below zero are not exceptional. In spite of this weather handicap, the railroad maintains excellent service in handling its freight traffic.

Electrified lines of this railroad total about 32 miles. The rolling stock consists of one 40-ton locomotive, one heavy double-truck motor freight car, four double-truck interurban motor passenger cars, one new 60-ton



New 60-Ton Locomotive of the Aroostook Valley Railroad Hauling 30-Car Freight Train

Baldwin-Westinghouse freight locomotive and a number of trail cars, both passenger and freight.

Several interesting features are included in the new locomotive. A central compartment houses the electrical equipment, except the compressors and blowers, which are mounted near the sloping hoods at each end of the cab. Air brake equipment is of the standard 14-EL type, particularly adapted for operating in multiple with standard steam railway equipment. The compressors are of the D-4-P, of 50 cu.ft. capacity.

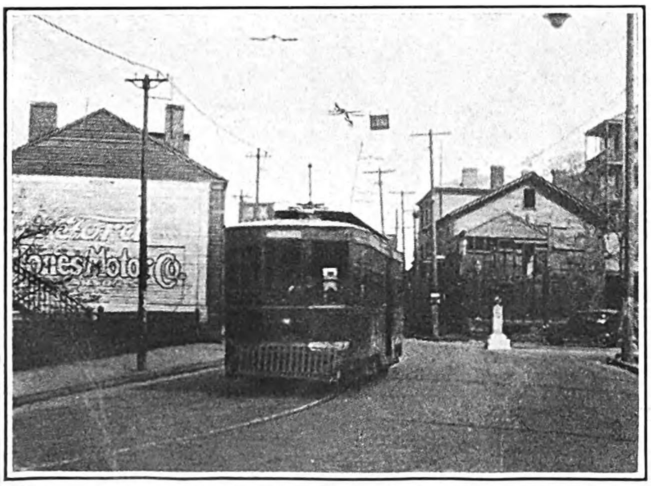
Motors are wound for 1,200 volts per commutator. An 800-cu.ft. blower motor equipped with ball bearings is used to ventilate the main propulsion motors, one of which is mounted on each axle. Air is obtained from the inside of one of the hoods. In this way the maximum protection from snow and dirt is afforded the driving motors. The air is conducted through an air duct formed by closing the space between the two center channels with a piece of iron sheeting and lead directly to each motor through a flexible air connection.

A feature of the electrical equipment is that all auxiliary circuits are fused to a common bus bar. Fuses of the expulsion type are used. A separate auxiliary control cutout switch is mounted adjacent to the auxiliary fuses so that by opening this switch the auxiliary fuse bus bar is dead and fuses may be replaced without danger to the operator.

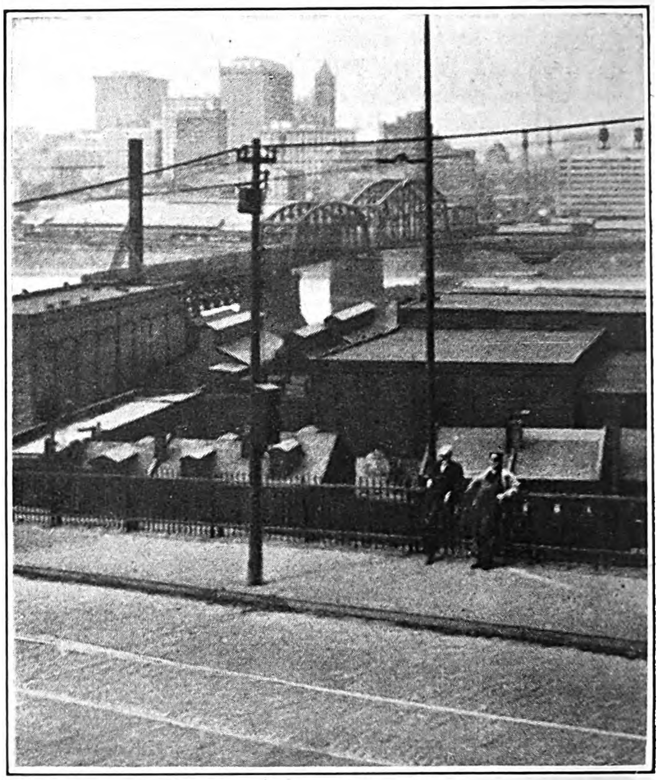
Resistance grids are mounted close to the ceiling directly under ventilators with the other main apparatus below and adjacent thereto. This arrangement, together with solid covers which inclose the greater portion of the control cabinet, allows the head of the grids to set up drafts which ventilate the control compartment. On account of the severe snows encountered, the headlights are mounted on swivel pivots directly under the roof overhang at each end of the cab.

Automatic Derails Protect Grades

RAILWAY operation in Pittsburgh has always been complicated by the existence of many long and steep grades. One of the worst of these grades is on Brownsville Avenue beginning at the south end of the Smithfield Street bridge and rising to the top of the south hills. To protect car operation on this street the Pittsburgh Railways installed a derail switch midway up the hill. Under this arrangement it was necessary for inbound cars coming down hill to stop while the conductor alighted and pulled the derail.



Car Passing Under Contactor of Automatic Derail on Steep Hill in Pittsburgh



Relays for Operating the Automatic Derail Switch Are Located in the Pole Box

Recently, however, two difficulties arose in connection with this operation. In the first place the opening of the Liberty Tunnels, which are reached via Brownsville Avenue, greatly increased the volume of vehicular traffic on that street. At times this was so great that the operation of alighting and pulling the derail was one of considerable danger. The desire of the railway to operate one-man cars on this route at certain times also complicated the situation.

A solution was found in the installation of an automatic derail switch. This is so arranged that passage of a car under the contactor causes a primary relay to close. This in turn actuates a second relay, which, however, is equipped with a slug on the outer end of the armature, causing it to vibrate. The derail remains open until this vibration ceases and the armature comes to rest in a closed position. Ten seconds is the period of time theoretically required, although in actual practice it varies somewhat. This time lag is sufficiently long so that a car going down hill must come almost to a dead stop between the contactor and the derail. Passage of the car under a second contactor opens the relay and the switch.

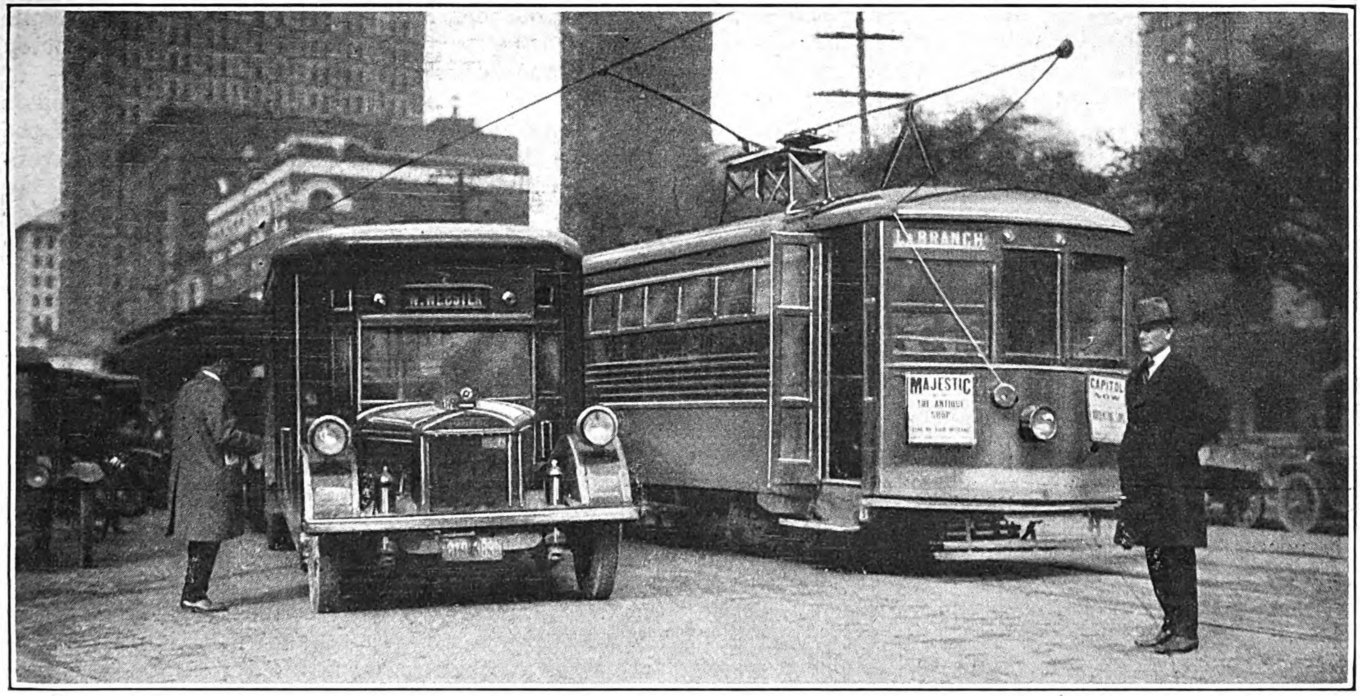
Installations similar to the one here described have been made by the Pittsburgh Railways in a number of other locations, all of which have operated satisfactorily to insure safe operation on steep grades.

In defining the functions of the "holding companies" in the public utility field, Samuel Insull, president Commonwealth Edison Company, Chicago, said recently that "most of the outstanding developments of the last twelve or fifteen years in the electrical field are due to the so-called holding companies, which have performed prodigies in spite of the handicap of the inept family name." Financially speaking, this type of company is an elaboration of the "investment trust" which was long since standardized in Great Britain.

Electric Railways Keep Pace in Rapidly Growing Texas Cities

Local Street Railway Lines and Interurbans Have Played an Important Part in the Development of Houston, Dallas, San Antonio and Fort Worth —A Spirit of Co-operation Has Been Built Up by Close Attention to Public Demands—Buses Are Operated by Railways in Houston and San Antonio

By Charles Gordon
Western Editor ELECTRIC RAILWAY JOURNAL



Buses and Cars Are Operated at the Same Fare in Houston. Transfers Are Issued Free

IN THE State of Texas one is met on every hand with unmistakable evidence of rapid development and growth. There is a spirit of friendly rivalry between the larger cities and a strong feeling of community consciousness and civic pride has been built up. Among the leaders in these communities transportation is recognized as an all-important factor in civic growth, and consequently the problem of financing extensions of service continually confronts the managements of the properties serving several of the larger cities.

Texas is a "home rule" state. Regulation of utilities is in the hands of local authorities in the various cities, who are directly subject to the opinion of the users of utility service. Under these conditions the railways are in a sense regulated by their own customers, and the problem of winning public favor and confidence is essential to successful operation. This has been accomplished to the extent of building up a generally fair attitude on the part of public officials in the several cities.

The railway managements have accepted their responsibility for rendering a complete transportation service and providing for newly built-up territory. The communities, on their part, have come to learn that unified transportation service under a single management is of utmost importance to healthy and normal civic development. Considerable progress has been made in working out arrangements to prevent the overextension of transportation lines into thinly populated real estate projects. Real estate men are gradually being brought to accept the principle of assuming the cost of transportation extensions into new territory where available traffic will not support the new transportation service.

NEW HOMES REQUIRE TRANSPORTATION

Development of the cities is based on agricultural, industrial and commercial growth throughout the state. Many homes are being erected for workmen or commercial employees. Consequently, rapidly growing residential sections are largely populated by good street car riders. In both Dallas and Fort Worth street cars are demanded in preference to buses, because of the permanence which the laying of rails lends to the element of transportation in a new community. In Houston and San Antonio, however, the bus has been adopted for serving certain sections. Although some of these lines are in the nature of a preferred or de luxe service, the bus is also being used for the extension of service into new territory in preference to the heavy investment required for electric cars and rail extensions.

Houston is a keen contender for business and industrial leadership of the state. Completion of a ship channel to the Gulf of Mexico has transformed this former inland city into a seaport and has put it into the position of becoming the water gateway into the vast resources of the Lone Star State. Important industries have found ideal conditions for development, and an optimistic view of the city's future importance seems to be well justified.

The Houston Electric Company has been actively identified as a progressive force in the community. After a period of serious jitney competition, the city was finally brought to see that a single transportation agency under responsible management is the only economically sound civic policy. The railway management has shown a sincere desire to extend its service to keep pace with the growth of the city. The bus has been used for this purpose, particularly where a demand for service has developed in newly built-up communities with paved streets where rail construction cost was considered excessive.

BUSES REPLACED JITNEYS

Some of the original bus lines in the city were put in to replace former jitney lines whose removal was made contingent on the institution of such bus service. The Houston Electric Company does not have an exclusive franchise to operate buses, but is dependent on popular acceptance of the principle that all transportation service should be rendered by one management. Due to this combination of conditions, buses at present are operated for the same fare as that charged on the street cars, namely, 7 cents cash and four tickets for a quarter. Transfers between buses and cars are issued free.

An accompanying map shows the complete transportation system, including both car lines and buses. A total of 21 buses are owned. These include seven Yellow Coach Model Z, 29-passenger buses, eleven Fageol buses with 29-passenger steel bodies, built by the American Car Company, and three Reos with nineteen-passenger city type bodies.

The Austin bus line extends southwesterly from the business district through a thickly populated residential section. Operation of this line was started in place of a former jitney route. This is a comparatively short line with heavy traffic. The base headways are eight minutes in the morning and six minutes in the afternoon. During the rush hours, additional service brings the headway down to four minutes. Fageol equipment is operated, and schedule speeds of approximately 10.25 miles per hour are maintained. The bus route parallels the South End car line, which is a single-track line with a large loop at the outer terminus. At some points inbound cars on this loop are approximately five blocks from a built-up residential section of considerable size. For this reason, the demand for bus service was insistent.

Due to the heavy density of traffic and the short route distance on this line, it has shown earnings of $13,000 a year above interest, depreciation and operating charges, even on the low rate of fare that is charged. Other lines in the city that do not have the same traffic characteristics have run up substantial losses. This is true of both the West Webster and the East End lines. In each of these cases the routes are considerably longer and the traffic much lighter than on the Austin line.

Experience with existing bus routes has convinced the Houston Electric Company management that bus service should be essentially a preferred type of service at a substantially higher fare than that charged on street cars. W. E. Wood, manager, is a firm advocate of the principle that all bus operations should be made self-supporting and that a rate of fare should be charged high enough to avoid making street car riders pay for deficits incurred in furnishing bus service to thinly populated districts.

Several interesting plans are being worked out to make specially benefited property carry the cost of service extensions into unprofitable territory. In one case a Reo bus is operated two trips per day to a cotton mill for the special convenience of the employees of this concern. This service is rendered on the basis of a direct charge of 20 cents per mile against the owners of the mill. In another case, a requested extension to a high-grade residential development is being negotiated on the basis of a guarantee of operating expenses by the real estate operator. In the working out of this arrangement the terms of contract and form of bond are being carefully studied. The purpose is to protect the transportation company against discontinuance of the agreement by the real estate operator before the district has been properly built up. Once a line is established, it is assumed that a demand for continuance of service, even at a loss by the transportation company, would be made if such a bond were not put up as a guarantee over a certain period.

In still another case a bus line is being contemplated as a substitute for a section of an existing rail line that must be either torn up or rebuilt. This service will extend to the Harrisburg section, which is about to become a part of the city. It is proposed to furnish an express bus service to this community from the business district, which will be operated at a minimum fare of 10 cents.

Buses in Houston are operated as an integral part of the railway organization. Drivers are selected from among the trainmen and are paid the same rate as one-man car operators, namely, 54 cents per hour. The superintendent of transportation has charge of the operation of buses and the master mechanic has charge of their maintenance.

BUILDING FRIENDLY PUBLIC RELATIONS

Frank understanding and a mutual endeavor to play fair in all respects are producing favorable and friendly relations between the company and the representatives of the community. Paid newspaper space is being used to tell the public about the operations of the transportation property. It is believed that a policy of frank co-operation is to the advantage of the company in gaining for it the complete confidence of the community.

Some general idea of the progress which has already been made in this direction is given by remarks made by D. J. Kirk, public utility commissioner of the city, before the recent annual meeting of the Southwestern Public Utility Association, held in Houston in May. He said there that most troubles between the public and its utilities are attributable to misunderstandings and suspicion. He expressed a firm conviction in favor of unified operation of all transportation facilities in a given community, and also opposed the indirect taxing of car riders through the requirement of paying for street paving out of car fares.

DALLAS AND HOUSTON ARE RIVALS

Dallas is also an active and energetic contender for industrial and commercial supremacy. From the standpoint of population, it is generally recognized that the two cities are close contestants for honors.

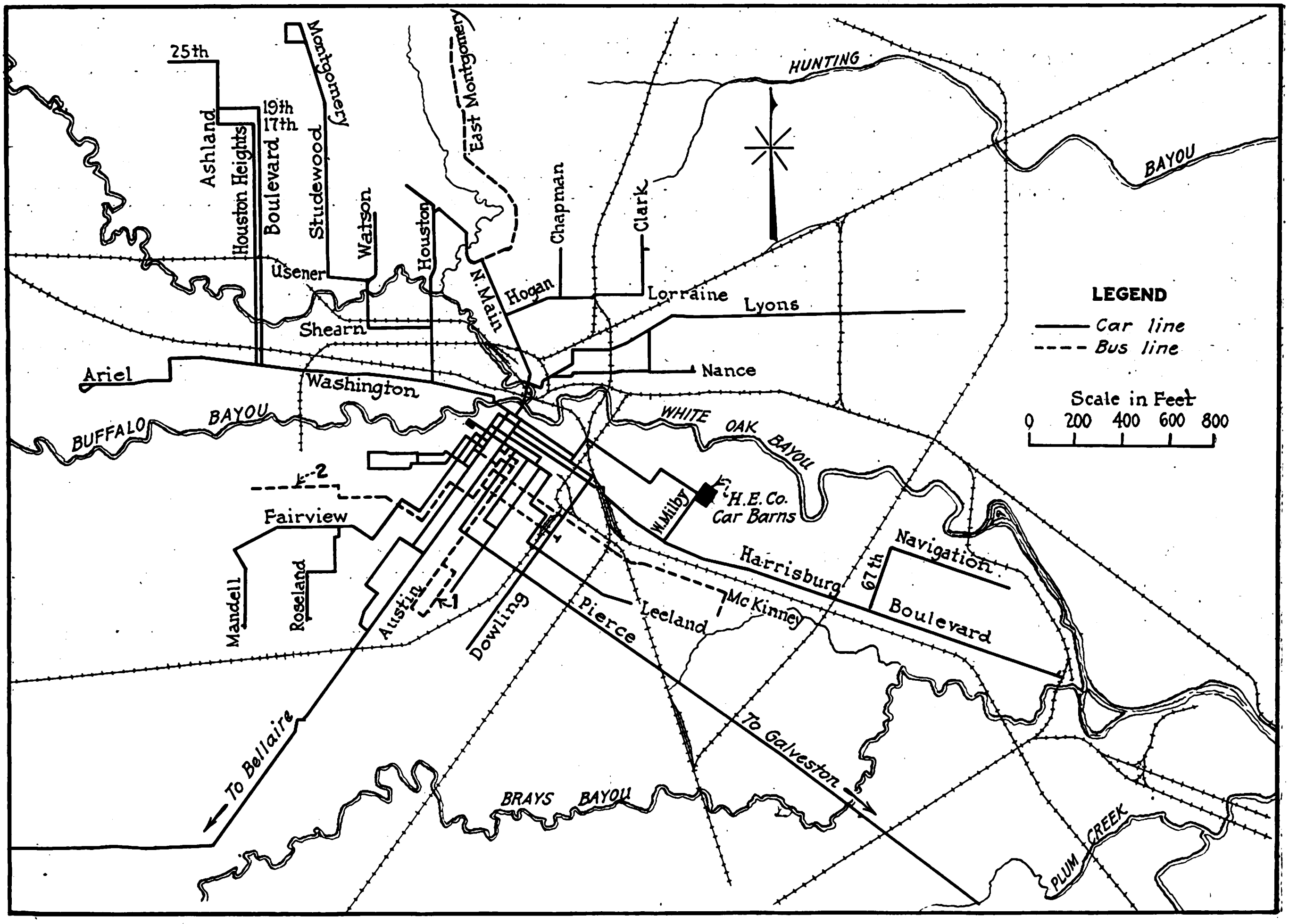
Interurban electric railways have played a large part in the development of Dallas. A modern terminal building and station, owned by the Dallas Railway, serves as the terminus for interurban lines radiating in all directions from the city. To the west, the Northern Texas Traction Company operates to Fort Worth, where connection is made with interurban cars operating to Cleburne. Thirty-minute service is given between the two cities. Local cars and non-stop limited trains are alternated throughout the day. The Texas Electric Railway extends southwest to Waco, southeast to Corsicana and north to Sherman and Denison. Hourly service with alternate limited and local cars to each of these cities is furnished.

Northwest from the city, the Texas Interurban Railway serves Denton. East from Dallas its line reaches Terrell. Hourly service, similar to that given by the other roads, is furnished. A marked distinction exists in the type of equipment operated by the Texas Interurban Railway. That of the other lines out of Dallas is of the heavy, high-floor interurban type, while low-floor, light-weight cars are used for both passenger and express service by the Texas Interurban Railway. The line to Denton is operated for most of the distance over the tracks of the M-K-T steam railroad. A complete description of this novel operation was published in the April 25, 1925, issue of ELECTRIC RAILWAY JOURNAL, page 647.

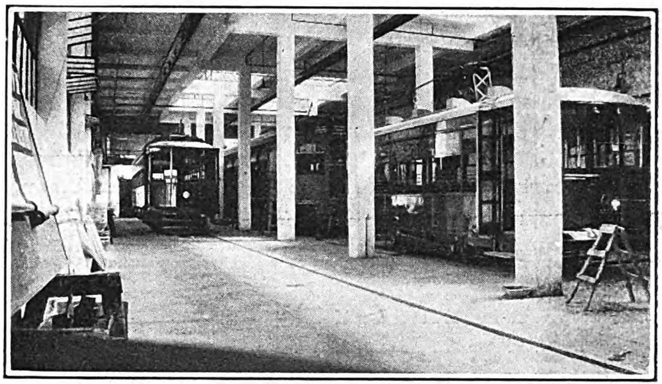
AUTOMOTIVE COMPETITION SERIOUS

Completion of good highways between some of the principal cities and towns in northern Texas has resulted in serious competition to the interurbans from private automobiles and buses. Texas has no regulatory law covering the operation of buses and until such law is obtained the problem of protecting the interurban investment is serious. The buses themselves are not free from competition. This has resulted in duplication of lines, which has made it extremely difficult for the interurbans to make any traffic interchange arrangements with bus operators, even on routes where such arrangements would build traffic for both by making the buses from outlying towns feeders to the interurbans.

Between Dallas and Fort Worth an independent bus line, operating Fageol intercity equipment, is making a serious fight for patronage with the Northern Texas Traction Company. The latter has been able to hold a


25th
19th
17th
Ashland
Houston Heights
Boulevard
Studewood
Montgomery
Watson
Houston
East Montgomery
Chapman
Clark
HUNTING
BAYOU
Usener
Shearn
N. Main
Hogan
Lorraine
Lyons
Nance
Ariel
Washington
BUFFALO
BAYOU
WHITE
OAK
BAYOU
LEGEND
Car line
Bus line
Scale in Feet
0 200 400 600 800
E-2
Fairview
Mandell
Roseland
Austin
E-1
Dowling
Pierce
Leeland
McKinney
W. Milby
H.E.Co. Car Barns
Harrisburg
67th
Navigation
Boulevard
To Bellaire
To Galveston
BRAYS BAYOU
PLUM CREEK

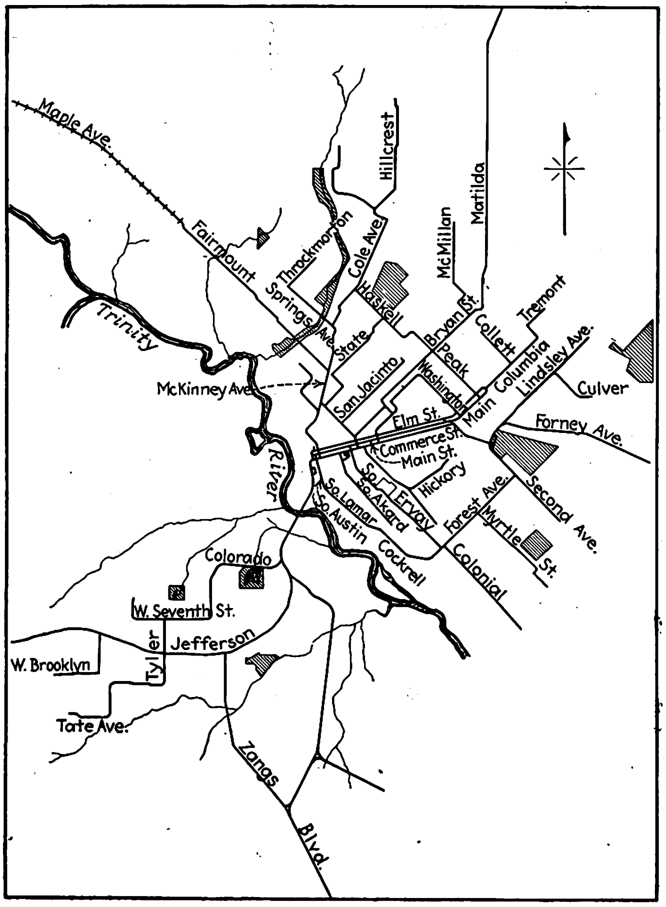
A Combination of Rail and Bus Lines Furnishes Houston with Complete Transportation Service Under a Single Management



A New Paint Shop, 50 Ft. x 160 Ft., Has Been Built in Fort Worth. Brightly Painted Cars Are Considered a Valuable Aid in Merchandising Service

substantial part of the traffic by the institution of non-stop express service with its new "Crimson Limited" trains. Despite this superior service, however, it is estimated that buses are taking nearly 20 per cent of the traffic between the cities.

The Texas Electric Railway has in the past been a profitable enterprise and has furnished a high-grade service to the communities it serves. This company also operates local street cars in some of the smaller towns on its lines. Buses and automobiles have made serious inroads on receipts, in spite of determined efforts to improve and sell the railway service. Not only is direct advertising used to build railway business, but advertising souvenirs are distributed over a wide territory contributory to the lines. In some of the smaller towns, where track reconstruction programs have become necessary, plans are being made to substitute buses for the local rail service.



Rail Lines Have Been Extended into the Rapidly Growing Residential Sections of Dallas. In Some Cases Real Estate Developers Have Assumed the Cost of New Railway Construction

DALLAS ATTACKS CONGESTION PROBLEMS

The Dallas Railway operates all of the street cars in the city. Both one-man and two-man cars are used. Double-truck one-man cars equipped with automatic treadle controlled rear exit doors are operated through the congested business district without difficulty. Street fare collectors at points of heavy traffic assist materially in expediting the loading of cars during the rush hours.

Commerce, Main and Elm Streets constitute the main arteries through the business district. Many lines converge on these streets and during the rush hours the traffic is very heavy. Narrow downtown streets add to the problem, but unusually rigid parking restrictions help to relieve the situation materially. Even taxicabs are prohibited from parking on the streets and taxicab companies are required to maintain downtown garages instead of using the already congested streets as cab stands. Synchronized traffic control signal systems are installed in the business districts of Dallas, as well as in Houston, San Antonio and Fort Worth. In all these cities pedestrian traffic moves on signal with vehicles. This regulation is closely enforced, and vehicular traffic is thus enabled to move rapidly at intersecting streets.

Residential sub-divisions in Dallas are being developed rapidly. These are striking evidence of the growth in population. As a result, however, the problem of making rail extensions is an acute one. In addition to new lines the rapidly growing demand for additional car service has required the company to carry on a steady program of double tracking existing single-track lines.

RAIL LINES PREFERRED TO BUSES

Extensions are being made by rail, rather than by bus. No buses are operated in the city and the demand for them has not been pressing. Narrow streets and congested traffic have been limiting factors of importance. Another has been that the sub-dividers of property and the new residents of built-up districts have insisted on car service rather than buses because of the permanence that is given to the transportation service, once rails are laid in the streets. In some locations transportation extensions have been requested by real estate operators before population would warrant the expenditure for laying rail. Under such conditions, the cost of construction is being met by the real estate development companies. Several extensions of this type have been put in recently.

A broad policy of cultivating friendly public relations is maintained by the company. No small part of this is the work of the transportation department among its employees who come in direct contact with the public. New men are not only carefully selected but, together with older employees, they are carefully supervised and instructed regarding their relations with the company's customers. New employees are recruited to a large extent from the rural communities of the state and consist of young men who have come to Dallas seeking employment. These men have been found to make the finest type of trainmen after having been properly instructed in their duties.

Contact with the local newspapers is maintained through the publicity department of the company. One example of the favorable results that are obtained by co-operation with the press of the city is the method followed in the case of accidents. For some time it has been the practice to furnish the newspapers with a full report of every important accident that occurs, regardless of whether or not the company was at fault. No attempt is made to color such stories in favor of the company. All the facts are given just as they occurred and as accurately as the company is able to determine them. So successful has this attitude of frankness been that the press of the city has come to rely on these reports and has largely discontinued the practice of sending reporters out to cover street railway accidents.

FORT WORTH MERCHANDISES SERVICE

Fort Worth, like the other large cities of the state, is growing rapidly. The city lines are operated by the Northern Texas Traction Company along with the interurbans to Dallas and Cleburne. Buses are not operated by the railway in Fort Worth and necessary extensions of service have up to the present time been made by rail lines.

Since winning the 1924 Coffin prize the company has by no means let down in its efforts to improve its service and then merchandise it by modern business building methods. Staff meetings are devoted largely to discussions of business building ideas. Some of the sales methods used will be described in a special article to be published in a subsequent issue.

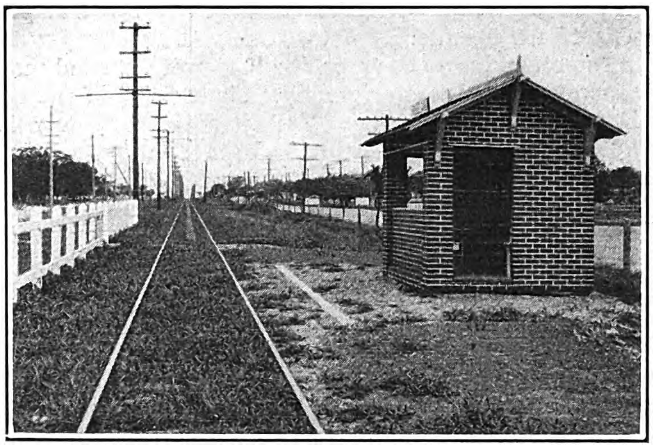
The Fort Worth management is a firm believer in the value of paint on its cars as a help in selling its service. A new paint shop recently has been completed. This is a concrete structure which measures 50 ft. x 160 ft. It has three tracks, each 130 ft. long, for the storage of cars to be painted. At one end a balcony 20 ft. x 50 ft. covers a paint storage vault and men's wash room below. This balcony is used for trimming, sign and sash work.

PROGRESSIVE IDEAS IN SAN ANTONIO

San Antonio, the oldest city in Texas, is also one of the oldest in the country. Its railway, however, is progressive and well abreast of the times. A policy of retiring older equipment, to be used only in emergency service, has been in force for some years and has resulted in the gradual replacement of old and heavy equipment with modern light-weight cars. As another phase of this policy, the bus is being used to supplement the rail system wherever it provides improved service or promises reduced operating cost.

A total of 120 street cars are now operated. These include 64 double-truck two-man cars and 66 single-truck one-man cars. Bus equipment consists of seven 29-passenger Fageols, one 29-passenger Yellow Model Z and eleven 21-passenger Reos.

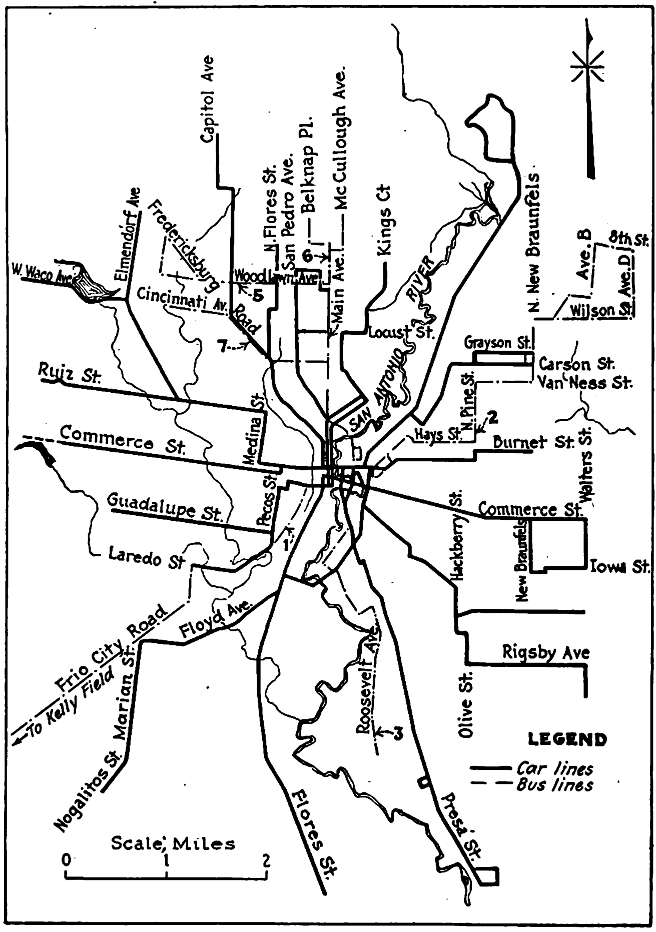
Car and bus routes in the city are shown on an accompanying map. Bus route 1 on the map was put in operation Dec. 1, 1923, to replace a single-track car line on which expensive reconstruction work would have been needed to keep it in service. This line serves South San Antonio and Kelly Field, an important army flying field. One Fageol bus is operated on an hourly headway during the base period and a second bus of the same type is put on during the morning and evening to reduce the headway to a half hour. Although this line is unprofitable, the use of buses materially reduces the losses over what they were when cars were used.



Small Wayside Stations, Between Dallas and Fort Worth, Are Made Attractive

An old rail, sunk flush with the ground in front of these stations, is painted white to mark the clearance limit of passing trains. A safety message appears on this marker. Note the fence between the tracks.

Line 2 on the map runs between the Alamo Plaza and Fort Sam Houston. This was put into service in September, 1923. Two Fageol buses in all day service furnish a twenty-minute headway, and two tripper buses during the morning and evening reduce the headway to ten minutes. This line gives service to Fort Sam Houston in addition to an existing car line which also reaches the fort. The fare on the cars is 6 cents, while on the buses throughout the city the fare is 10 cents, with a 4-cent charge for transfers from cars

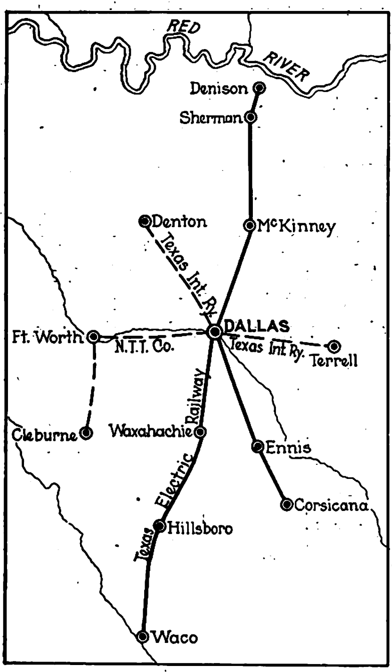

Capitol Ave
Elmendorf Ave
Fredericksburg Road
N. Flores St.
San Pedro Ave.
Belknap Pl.
McCullough Ave.
Kings Ct
W. Waco Ave.
Woodlawn Ave
Cincinnati Av.
Main Ave.
Locust St.
San Antonio River
N. New Braunfels
Ave. B
8th St.
Ave. D
Wilson St.
Grayson St.
Carson St.
Van Ness St.
N. Pine St.
Hays St.
Burnet St.
Walters St.
Ruiz St.
Medina St.
Commerce St.
Pecos St.
Guadalupe St.
Laredo St
Hackberry St.
New Braunfels
Iowa St.
Frio City Road
To Kelly Field
Marian St.
Floyd Ave.
Nogalitos St.
Roosevelt Ave.
Rigsby Ave
Olive St.
Flores St.
Presa St.
1
2
3
5
6
7
LEGEND
Car lines
Bus lines
Scale, Miles
0
1
2

Buses Supplement the Rail Lines in San Antonio. Most of the Bus Lines Terminate in Small City Parks Near the Business District

to buses. Within the fort the buses carry local passengers for 5 cents.

The other lines shown on the map were started more recently. No. 3 was originally a shuttle line at the end of the existing car line. Under these conditions the riding was very small and the operation was entirely unprofitable. Later the bus route was established from the business district so as to interfere as little as possible with the rail line and at the same time reach a district near the end that was previously inaccessible to the cars. Under these conditions the operation has been much more successful than as a shuttle feeder. One Reo bus furnishes 30-minute service over this line.

Practically all of the bus lines that radiate out into various sections of the city terminate in small public parks near the business district. At these points bus waiting stations have been established. Time clocks have been erected by the company for the convenience of passengers and employees and the city has provided benches for their comfort. A bulletin board carries a time-table so that the time of departure of the various lines can be conveniently determined. One of these park waiting stations, which is the terminus for several important lines, is directly across the street from the St. Anthony Hotel.



Dallas Is the Center of an Extensive System of Interurban Lines Which Have Played an Important Part in the Development of the City

Line 5 was put in operation in November, 1924. Two Reo buses furnish twenty-minute service on each leg of the route. Line 6 has been in operation since May of the same year. This is also in two divisions and three Reo buses furnish the required service. In this case one bus is assigned to each division, while the third alternates on each trip. One Reo bus is also operated on line 7, making the headway 30 minutes. As the buses on lines 5, 6 and 7 converge on a common route as they approach the business district, the schedules of the various routes are fitted into each other and the headway is gradually decreased.

As in the case of Houston, the bus and rail service are handled together by the same operating organization. Bus drivers are selected from the train service and are paid the same rate as one-man car operators. To keep men from switching back and forth between cars and buses, however, the seniority lists on buses are open only once a year, so that a man who has picked a run back on the cars after once having been on the buses does not have the opportunity of changing again for a year.

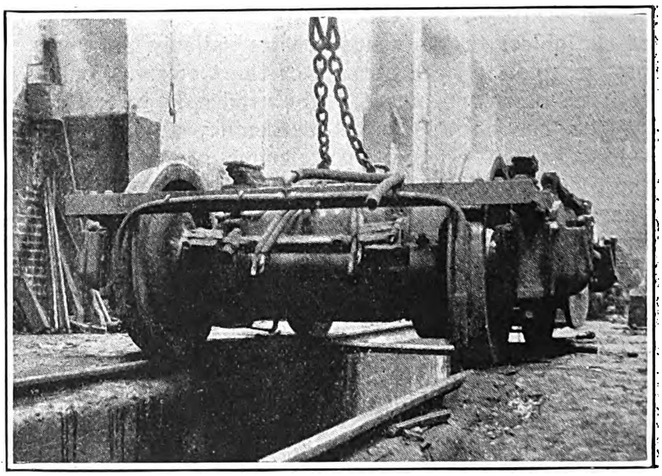
There is one distinct difference between the views of the Houston and San Antonio managements on the subject of bus taxation. In San Antonio the bus is taxed so as to put it on a comparable basis with street cars so far as tax burdens are concerned. A special license fee of $5 per seat is charged by the city for paving maintenance. This is estimated to be equivalent to the cost to the company per car seat operated for maintaining the paving between its tracks on car line streets. In addition, a $200 state tax, together with federal and special taxes, makes the total annual cost per bus approximately $600.

In Houston the management has contended for moderate taxes on the bus. It has been held that the car rider is now taxed unjustly for the cost of maintaining paving used by other vehicles and should be relieved of this burden as rapidly as possible. For this reason it is also held that such relief for the car rider would then put the bus and car on a comparable basis and would be a much fairer method of equalizing matters than to load the bus down with extra burdens just because the cars are already in this predicament.

San Antonio has been the more fortunate in its experience with buses in that a minimum fare of 10 cents is charged and a transfer charge is also made. Houston has demonstrated by experience that its fare of four tickets for a quarter with free transfers will not support the bus-operating costs except on very short lines of heavy traffic. There is prospect in Houston of converting the people of the city to the idea of making bus operation self-supporting. In both cities the managements look on bus service as a preferred type of service which justifies a rate of fare high enough for its proper operation.

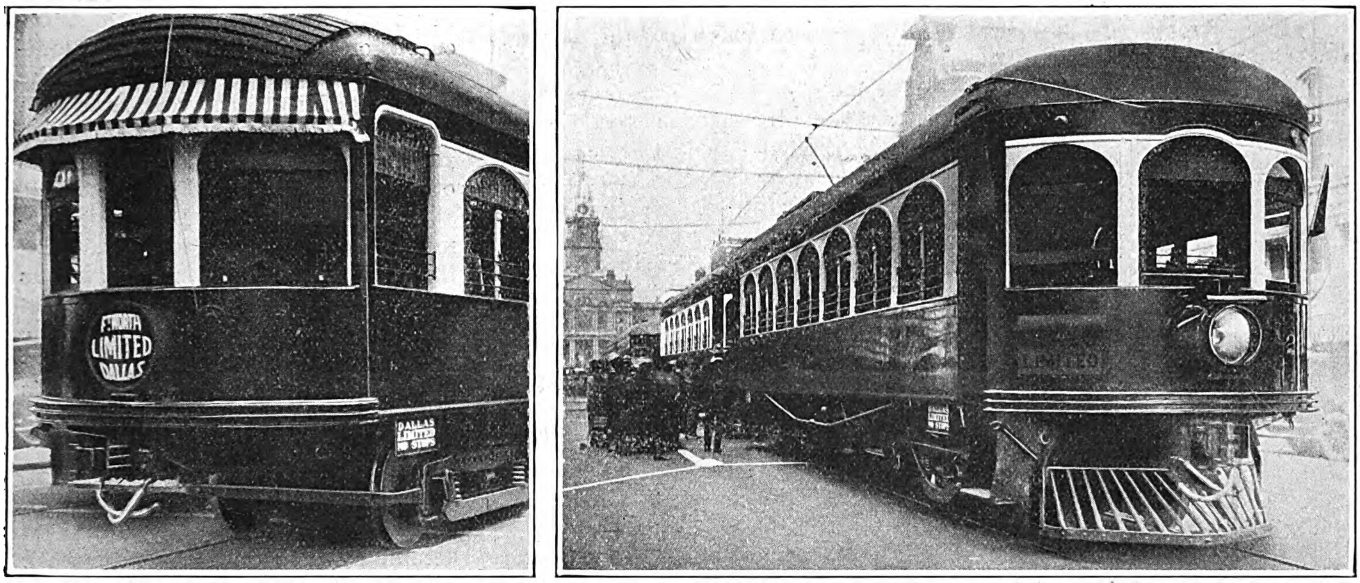
Sand Outlets Attached to Trucks on Interurban Cars

THE Washington, Baltimore & Annapolis Electric Railroad has adopted the practice of attaching sand outlets directly to the tracks of its interurban cars. This insures greater reliability in sanding track directly in front of the wheels, particularly on curves where the car body and the trucks are out of line.



Sanding Tracks on Curves Is Facilitated by Having the Pipes Attached to the Car Truck in This Manner

A 1-in. pipe bent to the shape of an inverted letter U is used. At the ends slightly larger pieces are attached to distribute the sand over the railhead. From the center of the horizontal section a tap is taken off through a rubber hose to the sand box. One sand box is located at each end of the car. Compressed air is used to force it through the pipe on to the track.



At Left, a Short Canvas Awning and Tail Sign Give an Observation Car Effect to the Rear End of the Train. At Right, Crimson and White Paint Are Combined to Good Effect in Improving the Appearance of This Interurban Equipment

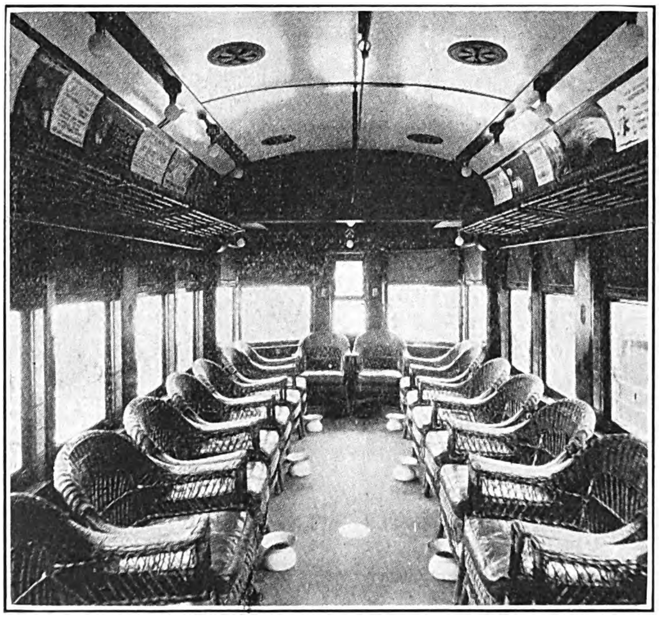
"Crimson Limited" Gives Attractive Interurban Service

Northern Texas Traction Company Improves Cars for Fort Worth-Dallas Non-Stop Service with a Special View to Merchandising—Combination of Colors Used to Give Streamline Effect

NON-STOP limited service between Fort Worth and Dallas, Tex., is given hourly by the new "Crimson Limited" trains of the Northern Texas Traction Company, recently installed. These trains are the result of the company's policy of building riders by combining three factors in its equipment; namely, an appearance which suggests speed and creates a desire to ride, fast service and comfortable seating.

Paint has been used to good effect in changing and improving the appearance of the cars, which had been in service a number of years and which in many respects are similar to the type usually operated on other high-grade interurban properties. This has been done by adopting a brilliant crimson for the letterboard and side panels, combined with white for the posts and drip rail. These bands of sharply contrasting colors tend to give the cars an elongated appearance by producing a streamline effect. In two-car trains, consisting of a motor and trailer, the effect is even more pronounced.

At the rear end of the trailer, a short awning adds an observation car appearance. An illuminated tail sign helps to carry out this idea. Seats of parlor-car type have been installed in the rear car. This is used as a club car and no extra charge is made for its use. It is designed primarily to appeal to the business man traveling between the two cities and to offer him in comfort a service which will induce him to make the trip by electric railway instead of by automobile.

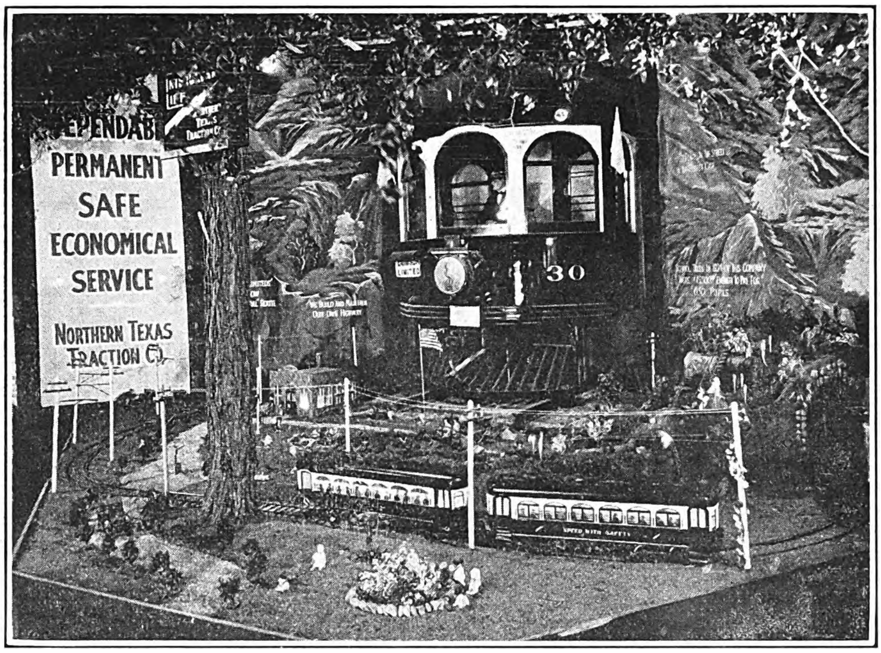


The Trail Car Is Equipped as a Club Car for the Convenience of Business Men Using the Service

The front car is entirely equipped with cross-seats. A smoking compartment of the type usually found in interurban cars is provided at the front end of this car. All cross-seats in the main passenger compartment have linen back covers similar to those used by steam roads on chair cars. These covers are visible from the street, and help to carry out the impression which is given by the rest of the train — that of first-class service.

Two-car trains of this type are operated on hourly headway throughout the day. A local service is also given at hourly intervals. This is alternated with the limiteds so that there is a train leaving the terminals at each end every half hour.

The "Crimson Limited" service has a distinct merchandising value, obtained



This Attractive Exhibit Created a Great Deal of Comment at a Recent State Agricultural Exhibition

by comparatively small expenditure for changes to the equipment. The new name is being capitalized in many ways for the purpose of building traffic. One good example is the exhibit shown in an accompanying illustration, which was recently displayed at the Texas Fat Stock Show. In this, a full-sized model of the front end of one of the new trains was set up in a canvas drop so that a realistic effect was produced. In the foreground, a miniature model of the train was electrically operated on a circular track. Carefully worded signs were placed about in this setting to call attention to interesting things concerning the company's operations.

Many other forms of publicity used by the company are being employed to advertise the service of the new "Crimson Limited." As part of this program an active campaign of personal solicitation is under way to call to the business man's attention the advantage of using this service.

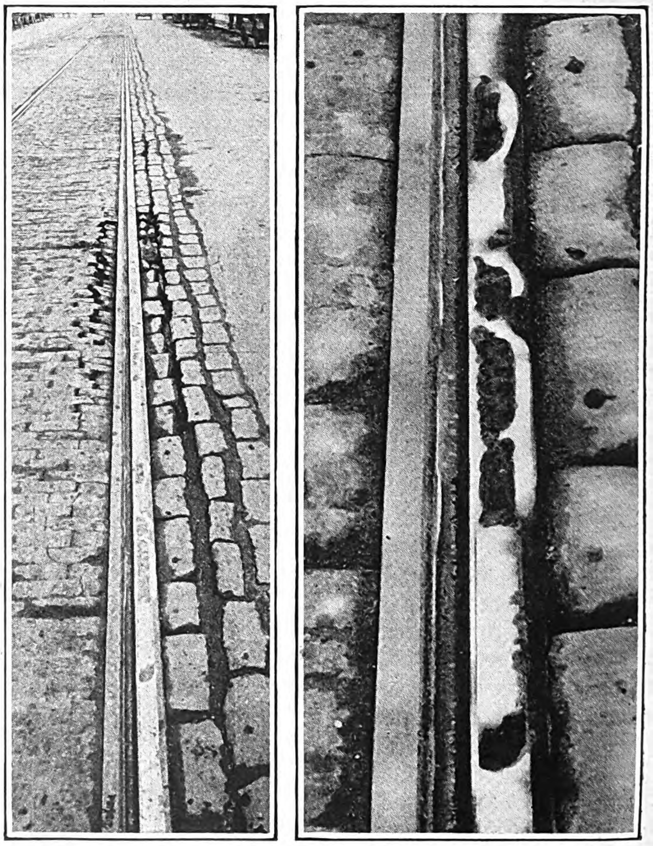
Experience with Surface-Hardened Rail in Toronto

THREE years experience with surface-hardened rail treated by the *in situ* process in Toronto has shown a number of interesting results, but in the opinion of the management of the Toronto Transportation Commission its success or failure has not been demonstrated conclusively. In favor of the process, it has been found that the rate of wear on untreated rail is from two to 2½ times as fast as on treated rail. This is about the same as the experience of a number of British tramways. Moreover, it appears that treatment by the *in situ* process has lessened the recurrence of rail corrugation. On the other hand, serious difficulty has been experienced with scalings.

In 1922 this treatment was applied with a high-pressure blowpipe to sections of track on Danforth Avenue, College, Yonge and Queen Streets. The following year it was applied with medium and low-pressure blowpipes to sections of track on Bay Street and on Lake Shore Road. Scalings appeared in the spring of 1923 on Danforth Avenue, College and Yonge Streets. A year later additional scalings occurred on Danforth Avenue. Examination of these sections early in the spring of the present year showed a number of additional defects on Danforth Avenue, but no change in the other treated sections.

Scalings on track in Danforth Avenue are shown in an accompanying illustration. These were so serious that it was not considered economical to make repairs by welding. The outer rail has therefore been replaced. An interesting fact in this connection is that these scalings have all occurred on the outer rail of double-track construction, the devilstrip rail not being affected except in so far as evenness has developed on account of defects in the outer rail. As yet, no defects have occurred in the sections treated in 1923 with a low-pressure blowpipe.

The following points have been noted by the management, but no adequate explanation of them has yet been found: (1) That practically all defects have occurred on the curb side rail; (2) that practically all scalings have occurred during the colder months; (3) that by far the greatest number of defects have occurred on 90-lb. rail which had been in service about nine years; (4) that practically all defects have occurred where the treatment was made with a high-pressure blowpipe; (5) that on Danforth Avenue the thin treated area along the top of the rail near the gage line has become roughened, though it can hardly be classed as scalings.



Scaling Has Occurred in Toronto on Surface-Hardened Rail Treated by the In Situ Process

Association News & Discussions

Electrification Considered by N.E.L.A.

United States Installations Small, Although Comprising 25 per Cent of World's Total—Standardization of System Considered Essential—Electric Railway Men Among New Officers of the Association

STEAM railroad electrification was the subject that predominated at the concluding session of the National Electric Light Association convention, held on June 19 at San Francisco. In its report the association committee on the electrification of steam railroads told of what had already been accomplished in this country and abroad and what was under contemplation in the United States.

Speaking on the subject "Electrification of Transportation," Paul S. Clapp of the United States Department of Commerce outlined the advantages of railroad electrification as well as the practical difficulties under which the railroads would eventually change their motive power from steam to electricity.

"The movement of electrification will be hastened by action in at least two major directions," said Mr. Clapp. "First, by the further development of interconnected central station systems as a source of power supply; second, by the adoption of certain standards which will enable us to develop a unified transportation system and simplify the equipment.

"Interconnected systems can rightfully be considered as more than a substitute for electric power plants which the railroads would otherwise be required to build. They are themselves an impelling reason for electrification. No means has yet been devised by man for more complete utilization of natural resources—fuel and water—than these interconnected systems. The huge central stations made up of large efficient units operated under closest and constant supervision burn coal with maximum results. No more efficient units of such size for conversion of fuel into energy have ever been built. They are able to accumulate large fuel reserves at advantageous times. They can use lower grades of fuel than are possible in locomotives. Such plants can be advantageously located for coal and water supply. Through interconnection large water powers can be developed and more widely distributed. Secondary water power which arises from seasonal flow of streams is utilized in larger quantities.

"All of this results in more economical production and distribution of power. It insures the continued presence of a reliable and adequate power supply, such as is absolutely essential for electrification, and makes this power available at points wherever it may be needed. It enables us to apply water power effectively to transportation. Security of power supply against interruption is safeguarded, since the source of energy is not limited to a single station. Fluctuations in power demand with variations in traffic are more readily absorbed. Additional power required for increase in traffic or extensions will be available without new investment of capital by the railroads."

Uniform plans for electrification, the speaker declared, are an essential if we are to develop a co-ordinated national transportation system. A patchwork of railroad mileages with a variety of electrical characteristics spells inefficient operation, lacks flexibility and is wrong from the standpoint of national defense.

COMMITTEE EMPHASIZES NEED FOR STANDARDIZATION

The committee on the electrification of steam railroads (Frank R. Coates chairman) quoted in its report the statement made before the A.I.E.E. on May 5, 1925, by the Secretary of Commerce, reviewed what has been accomplished in steam road electrification in this country and the work contemplated, and gave an outline of what has been accomplished abroad. In the statement quoted, Secretary Hoover emphasized particularly the need for standardization both in railroad and power company generating and transmitting equipment in order to prevent waste and facilitate the development of a co-ordinated electrified transportation system. In reviewing past electrification the report said that all of these installations have been superior to the steam service replaced. This has been particularly true in respect to availability for service, flexibility in operation, dependability and economy.

SUMMARY OF ELECTRIFICATION, ALL FOREIGN COUNTRIES

Country	Route Miles	No. Locomotives	Total Tons
Norway	125	43	3,064
Sweden	744	115	11,406
England	28	33	2,328
Germany	635	312	32,515
Austria	543	85	5,107
Switzerland	636	224	21,259
Italy	563	526	40,624
France	659	349	27,618
Spain	80	22	1,595
Canada	38	17	1,283
Mexico	30	10	1,540
Chile	148	45	4,402
Brazil	27	25	2,325
Argentina	..	2	147
Australia	..	2	100
New Zealand	8	5	268
South Africa	171	78	5,820
Japan	48	56	4,064
Java	31	6	420
Total	4,504	1,955	165,894

PLANS GOING FORWARD ON SEVERAL RAILROADS

The electrification plans which are now part of construction programs concern the systems of the New York, New Haven & Hartford Railroad Company, Norfolk & Western Railway Company, Illinois Central Railroad Company and Virginian Railway Company.

The first two companies have parts of their lines already electrified, the New York, New Haven & Hartford Railroad Company having completed virtually 100 per cent electrification between New York and New Haven. The Illinois Central has already started electrification of its suburban lines, power to be supplied by the Commonwealth Edison Company, and the Virginian Railway Company is completing construction on a part of its system with heavy grades, particularly to handle heavy coal trains. The Pennsylvania Railroad is carrying out extensive tests of equipment in preparation for electrifying its main line between New York and Washington and additional Philadelphia suburban lines. The Great Northern also is making extensions to its electrified system, and railroads having tracks within the New York City limits are making plans for complete electrification in accordance with recent legislation.

In foreign countries electrification has made greater progress in the past few years than in this country, this progress being largely due to a desire to use hydro-electric power and conserve fuel. The table gives a brief

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 17-18—**Mid-West Claim Agents' Association, Hotel Jefferson, St. Louis, Missouri.**

July 22-25—**Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

July 24-25—**Central Electric Railway Accountants' Association, Hotel Waldorf, Toledo, Ohio.**

August 12—**Metropolitan Section A.E.R.A., Summer Outing at Pelham Bay Park.**

August 13-14—**Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.**

August 27-28—**Iowa Electric Railway Association, Operators' Section, Hanford Hotel, Mason City, Iowa.**

Sept. 10—**Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.**

Oct. 5-9—**American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

summary of progress in electrification abroad.

The following officers were nominated and elected for the ensuing year:

President, J. E. Davidson, Nebraska Power Company, Omaha, Neb. Vice-president, R. F. Pack, Northern States Power Company, Minneapolis, Minn.; H. T. Sands, Charles H. Tenney & Company, Boston, Mass.; P. S. Arkwright, Georgia Railway & Power Company, Atlanta, Ga., and J. B. Miller, Southern California Edison Company, Los Angeles. Treasurer, W. A. Jones, H. L. Doherty & Company, New York. The members at large comprise Franklin T. Griffith, Portland, Ore., ex officio; H. C. Abell, New York; H. M. Edwards, New York; Edwin Gruhl, New York; E. W. Lloyd, Chicago; I. E. Moultrop, Boston, and Harry Reid, Indianapolis.

The electrical manufacturers' representatives are E. M. Herr, Westinghouse Electric & Manufacturing Company; Gerard Swope, General Electric Company, and W. A. Layman, Wagner Electric Corporation. The national section chairmen will be appointed by President-elect Davidson after July.

Wisconsin Meeting in August

THE Railway Section of the Wisconsin Utilities Association will hold its annual summer meeting on Aug. 13 and 14 in the new Hotel Wausau at Wausau, Wis. The convention will begin at noon on Thursday with a "Get-Acquainted Luncheon" at the carhouse of the Wisconsin Valley Electric Company. There will be songs and rollcall stunts. The general topic for the afternoon is "Shop Practice." A movie reel on the manufacture of cars will be a special feature.

An informal dinner followed by dancing will be held on Thursday evening at the Wisconsin Valley Electric Company Park at Rothschild, overlooking the Wisconsin River.

Several subjects of interest will be presented and discussed on Friday morning in the meeting room of the Hotel Wausau. A special luncheon for men and women will be served at the hotel at 1 o'clock. At 2:15 a mountain climb will be conducted up Rib Mountain, the highest elevation in Wisconsin. Saturday will be devoted to fishing, golf, and sightseeing trips.

Public Utility Storekeeping*

By K. C. Campbell
General Storekeeper Detroit Edison Company

PROVIDING materials and supplies for the various departments requiring them is a storekeeper's first and most obvious duty. He is expected to meet any demands within reason on the one hand and not allow his stock to reach an unreasonable figure on the other hand, which may cause him to be criticised by the financial executive of the company. It should be realized that in the public utility line it is essential that the stores department be so organized that sudden demands for material may be met. Company policy may cause a complete rearrangement of plans without previous notice and the stores department, together with the purchasing department, must meet this condition without wasting time questioning why more notice was not given.

From the purchasing agent's viewpoint there is a tendency, well repressed perhaps, but existing nevertheless, to make a good showing by purchasing occasionally, for the sake of a bargain, material which either may not be needed at the time or is not needed in such large quantities. To buy advantageously is good purchasing, but to have on hand an excessive stock is poor storekeeping. To keep these two conditions in balance is good management on the part of everybody concerned. In my mind if both the purchasing agent and the storekeeper are men of the right caliber there will be no difference of opinion in such matters if each proposition is weighed strictly on its merits from a broad company standpoint.

One thing which I would like to emphasize is the advisability of centralizing all stores under one head. Storekeeping is a line of work by itself and to attempt to consider it as a side line is a mistake. If various departments are allowed to procure and keep their own separate stocks the result will be costly for the company. Not only will the turnover of the aggregate stocks be poor and the investment high but material will become obsolete and useless. It is much better by far to intrust all matters connected with stores to one man and allow him to develop a suitable organization.

In public utility companies most of the departments have their duties pretty well defined and the executives can easily gage whether they are performing such duties satisfactorily. In many cases, however, a storekeeper will operate for some time on what he considers a satisfactory basis and suddenly be called to task by the management for having what it considers too high a stock and a poor turnover.

This state of affairs shows a lack of understanding between the storekeeper and the executives on matters about which there should be no element of doubt. The executives should declare themselves by stating precisely what they expect in regard to turnover and money invested. The storekeeper should know exactly what his limits are and should be able at any time to know from his own records and reports whether he is conforming to standards set by the executives.

This standard should be a stock budget, one simple form of which is a budget of stock limits. Through this, executive approval can be set on a certain running investment in stock and they can control it closely by requiring all additions to be submitted for approval. The executives can do their part by advising the stores department as soon as new projects are decided upon and when any changes in work in progress are made.

A stock budget is particularly valuable in the case of spare parts, as it can be seen that the ordinary plan of replenishing stock according to demand and turnover cannot be applied in this case. Every public utility company should make a careful study of the question of spare parts and after weighing the relative importance of the various kinds of apparatus and its liability of failure it should invest in spare parts accordingly. It should not be necessary to emphasize that the storekeeper should co-operate with the company engineers by having this stock in the right place and ready for instant use in case of emergency and also by seeing that it is promptly replaced.

Duties of Control Group

One branch of the work in our own company may be of interest to you. This is a so-called control group, operating within the stores department, whose duty, as its name indicates, is to control the investment in stock. This group studies the turnover of each and every item, approves the locations at which they are carried and approves all purchases and transfers. All dealings with other departments on stock matters, including keeping in touch with jobs in the field, are carried on by this group. This field work is necessary on the larger projects to make intelligent estimating possible and is of great help in providing material at the right time. The control group makes intensive studies of items or groups of items which become "dead" or on which the turnover has become poor. As a result of these studies appropriate action is taken. By putting this responsibility on a separate group, we have attained more efficiency than by having it scattered. We have not lessened in any way the individual responsibilities of the warehouse foremen and others having to do with the various phases of storekeeping, but on the contrary through this control group we have a more thorough check on them than we did before.

The control group makes up each month for the financial executives of the company a six months' forecast of stock to be received and used and also a forecast of stock balances in the various classes. These estimates are based on the latest and most authentic information which can be obtained from various sources on future company plans as well as work in progress. They are necessarily subject to revision when plans are changed and are of considerable assistance to the executives in providing money and for the store department in providing material. The estimates enable the control group to live within the limits of the stock budget and where necessary furnish the information to back up requests for additions to the stock budget.

It is presumed that all public utilities have a salvage department, even if in some cases it is not known by that name. Salvage work needs co-operation on the part of each department from which the salvage originates, the storekeeper who handles and stores it and the purchasing agent who sells the residue which is not used up again on company work. In the first place the salvage man should have advance notification of when property is to be removed from the system. I am not referring to small items, including scrap of all kinds, which are constantly coming in and which are handled through standard departmental routine, but to the items of machinery and equipment which need special action.

---

*Abstract of paper read at the annual meeting of the National Association of Purchasing Agents, Milwaukee, May 25-28, 1925.

There should be a salvage man in the purchasing or stores organization whose prime duty it is to handle salvage from the time it is to be removed from the system until it is ready to be sold by the purchasing agent. He should act as a go-between for all departments concerned and should have available at call the services of the experts in all departments who are qualified to decide on such points as possible further use of equipment, etc.

Standardization of stock is a subject which has attracted a good deal of interest among the storekeepers and purchasing agents of our industry. Several large companies, including ourselves, have gone into this matter very thoroughly and have made up stock catalogs for distribution among the various departments. The stock catalog is revised as often as necessary, and by following it both the purchasing agent and the storekeeper may be sure that no items of stock are being purchased unless they have been properly approved as being standard. The storekeeper may also guard against accepting into his stock any nonstandard items removed from the system.

National Motor Bus Association Organized in Chicago

DELEGATES representing state associations or motor bus interests in 21 states scattered throughout the country formed a national motor bus association at a meeting held in Chicago on June 16 and 17. Approximately 100 bus operators and others interested in the industry attended this organization meeting. Delegates representing state associations in Massachusetts, Virginia, Ohio, Michigan, California, Washington, Kentucky, Oklahoma, Idaho, North Carolina and New York, together with operators from many other states and manufacturers' representatives, laid the groundwork for a national association.

This meeting is the outcome of a preliminary conference of bus men from ten states, held in Washington, D. C., last month. At that time an organization committee was appointed to formulate preliminary plans. This committee recommended the organization of a national motor bus association under the control of a board of directors and advocated affiliation with the American Automobile Association upon certain conditions laid down in a set of resolutions.

Ernest N. Smith, manager American Automobile Association, addressed the assembled bus men, and outlined briefly the plan of the A. A. A. for broadening its activities by setting up both a motor bus and truck division. He objected to the terms of the resolution prepared by the special organization committee. Action on the committee report had been postponed pending Mr. Smith's arrival. After he had spoken the bus men voted to proceed with the organization of a national association along the lines proposed, but to leave the details of negotiations for affiliation with the A. A. A. to their new board of directors. Thus the new organization was definitely formed, and although it will endeavor to work out an arrangement for affiliation, it was the sense of the meeting that the bus men would proceed to perfect their own organization, even if an affiliation with the A. A. A. did not prove possible.

A constitution was prepared for the new association, and officers were elected for the ensuing year. The plan of organization is built around the state associations. Each existing state organization is to be invited to join the new national body, and the bus men in states which do not have state associations will be urged to organize and become members of the new national association. Membership will be on the basis of the number of buses operated. The dues are to be fixed later by the board of directors.

The various states in the country are grouped into zones, dividing the country up into seven such districts. One representative from each district is to sit on the executive committee, so that representation will be given to local interests in various parts of the country.

Officers and members of the executive committee elected for the ensuing year were as follows: President, R. W. Sanborn, Cleveland, Ohio; vice-president, William T. Crawford, Portland, Ore.; treasurer, R. L. May, Washington, D. C.; executive committee, District 1, R. M. Sparks, Boston, Mass.; District 2, Dr. McMains, Pennsylvania; District 3, S. A. Markel, Richmond, Va.; District 4, G. P. McCallum, Detroit, Mich.; District 6, Ward Faulkner, Muskogee, Okla.; District 7, Thomas Morgan, Oakland, Cal. The election of a director for District 5 was left with the remainder of the new board.

Legislative resolutions adopted by the meeting were as follows:

Resolved, That Congress should enact legislation giving the Interstate Commerce Commission the power to grant or refuse certificates of public convenience and necessity to motor carriers engaged in interstate commerce. In view of the fact that the Interstate Commerce Commission is now overburdened with work and because of the fact that states through which such motor vehicle lines operate are primarily interested in such operations, the authority of the Interstate Commerce Commission should be limited to the granting or refusal of certificates.

Certificates should be granted as a matter of form in all cases in which the application for a certificate is accompanied by certificates from the state public utilities commissions of the various states through which the motor vehicle line is to operate, certifying that such lines will serve the public convenience and necessity. (The term state public utilities commission comprehends state authorities regulating public utilities regardless of by what name called. In states where there is no public utility regulation of motor vehicle common carriers the state highway commissioner may issue such certificate.)

In cases where such certificates from state public utilities commissions cannot be obtained by the applicant the Interstate Commerce Commission shall grant a hearing on the application for a certificate in order to determine whether such operation is a matter of public convenience and necessity. In determining that fact the commission shall take into consideration existing motor transportation facilities. In all other questions involving certificates the Interstate Commerce Commission shall act as an arbiter in determining differences of opinion between the public utilities of the state through which such lines operate. All other regulation of operation of interstate motor vehicle common carriers shall be exercised by the state public utilities commissions of the states in which the operation is carried on.

Resolved, That a respectful request be made to the Honorable Secretary of the Treasury to include in his tax reduction recommendations to the 69th Congress the abolishment of all federal motor vehicle excise taxes.

Resolved, further, That a like request be made to the proper committee in the House of Representatives and the Senate of the United States Congress.

Resolved, further, That every state motor bus association be urged to take similar action and solicit every individual bus operator to interest himself in an effort to abolish this unnecessary burden by a direct appeal to the Congressmen from his district and the Senators from his state.

In view of the transcendent importance of the subject of interstate regulations, your committee on resolutions respectfully recommends that a special committee of three be appointed to examine the various legal questions involved and to represent this association in an effort to harmonize and compromise any differences that may arise between organizations interested in interstate regulations and to confer with the National Association of Public Utility and Road Commissioners, the Interstate Commerce Commission, the Bureau of Good Roads, etc., and from time to time to report progress and make recommendations to the executive committee of this association.

Engineering Education Under Investigation

ELECTRIC railway managers and many others in their organizations are vitally concerned with the results of technical education. Much important material was presented at the 33d annual convention of the Society for the Promotion of Engineering Education held at Union College, Schenectady, N. Y., June 16 to 20, 1925. Outstanding in importance was the preliminary report of the board of investigation and co-ordination of the society, whose work to the extent of $108,000 expenditure is being financed by the Carnegie Corporation. The board has already found, from an extensive canvass, that entering students are not well prepared for technical training, particularly in mathematics and English; that more than 60 per cent drop out before graduation, and that there is need for college training in the principles of economics and the knowledge of business procedure. With all of these educational difficulties the college faculties are trying to cope.

Turning from what may be termed the negative to the positive side, there was a general agreement that the function of the technical college is to give training in fundamentals of mathematics, science, the humanities and engineering. As a large part of the graduates eventually occupy administrative positions they also need training in human relations.

F. C. Pratt, vice-president General Electric Company, explained what his organization is doing to adapt technical graduates to the electrical industry. The program covers all grades of talent and of late special attention has been given to intensive training of a few scrupulously selected men for positions of leadership. The company is also co-operating with Union College and Massachusetts Institute of Technology to bring education and the electrical industry into closer touch.

At the conclusion of the meeting Dean G. B. Pegram, Columbia University, was elected president. Dean F. L. Bishop, University of Pittsburgh, was re-elected secretary.

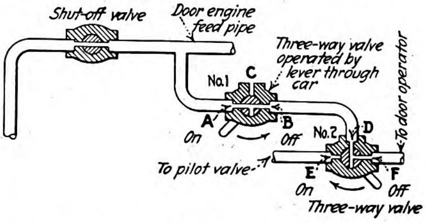
Maintenance of Equipment

Operating Rear Door from Any Point in Car

WHERE cars with door engines are used for either one or two-man operation and where safety automatic brake equipment is used it is desirable to control the rear door from different points in the car. For one-man operation both front and rear doors should be controlled by the operator from the front vestibule. With two-man operation, the front door should be controlled by the motorman, but the rear door should be under the control of the conductor. Where fares are collected in the car, it is necessary for the conductor to leave his station on the rear platform, and in such cases it is sometimes convenient to arrange so that the rear door can be operated from other points in the car than the conductor's station at the rear.

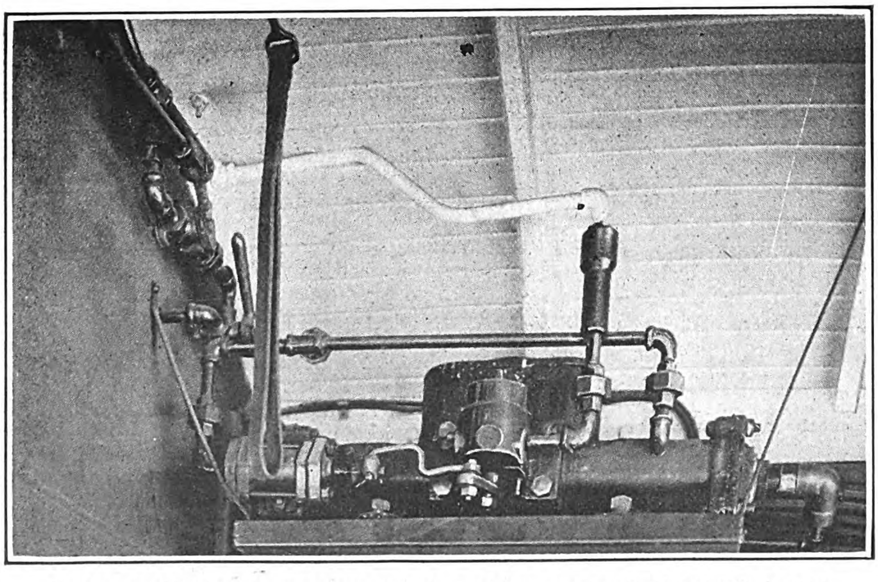
To provide for these conditions, the New York State Railways has provided valves in the piping for the rear door engine, as indicated in the accompanying illustration. This arrangement was devised by H. S. Sweet, engineer of equipment. Refering to the accompanying diagram, where one-man operation is used, the valve No. 2 is placed in its "on" position. This connects the pipe from the pilot valve to the door engine, which is designated on the diagram as *E* and *F*. The pipe *D*, which is used for two-man operation, is also closed off.

With two-man operation valve No. 2 is placed in the "off" position. This connects pipes *D* and *F* and closes pipe *E*, thereby allowing the rear door engine to be controlled by valve No. 1. This latter is a three-way valve, connected to a lever-operated rod which runs through the car and which was previously used for operation of the fare register. This valve No. 1 can thus be operated from any point in the car body, and by moving it to the "on" position the pipes *A* and *B* are connected, which connect the door engine feed pipe directly to the door-operating pipe. By moving valve No. 1 to the "off" position, pipe *B* and *C* are connected, so as to exhaust air from the door engine and close off pipe *A* from the feed pipe.



Piping Diagram for Rear Door Engines on Cars Operated by One or Two Men

A shut-off valve is also installed in the door engine feed pipe and the emergency pipe is extended to the rear vestibule. In case of emergency, all that is necessary for the conductor to do is to open the shut-off valve, which will allow air to exhaust from the emergency pipe and throw the brakes into emergency.



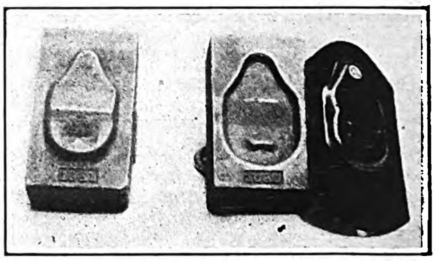
Valves and Piping to Door Engine Provide for Operation of the Rear Door from Any Point in the Car Body

Punch and Die for Forming Journal Box Covers

By T. E. Wood

Master Mechanic Omaha & Council Bluffs Street Railway

JOURNAL box covers for practically all types of trucks used in Omaha are punched from sheet steel with the die equipment shown in the accompanying illustration. Both the die and punch are made of cast iron and are used in a large blacksmith's punch and shear. Covers for boxes of various sizes are all formed with the same die, and are then trimmed to proper size and shape on a serpentine shear. Thus the pieces may be run through the press in comparatively large lots and trimmed for various size boxes as required.



Journal Box Covers in Omaha Are Formed Quickly in This Die

Engine Raised Auto Tower

HORSE-DRAWN tower wagons have been entirely replaced by motorized units for line construction and repair work of the Market Street Railway, San Francisco, Cal. These motor-driven towers have almost revolutionized the work of emergency line repairs on the system.

When the plan was made for changing to auto towers, two novel features were adopted. The tower was made of three stages instead of two, and was raised and lowered by the auto engine. The first feature allowed the platform to be raised higher and, when telescoped down, the platform was lower than on the two-stage tower, thus lowering the center of gravity of the whole vehicle for safety, while operating at high speed. It also dropped the tower down so low that the clearance over the top of the vehicle was increased.

The second and most important novelty was the arrangement for raising and lowering the tower from the auto engine. This was accomplished very simply by the use of the ordinary hoist used to lift the front end of the dump body on a dump-body truck. This had, up to that time, never been attempted on a tower.

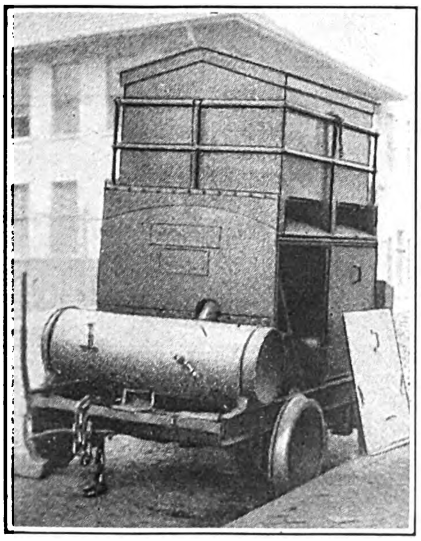
Formerly, when sent to a piece of repair work, the tower wagon stopped at the side of the street. The linemen laboriously raised the tower by the hand cranks, then they climbed to the platform, the driver drove out under the trolley wire, and the work was begun. With the motor-raised tower, the men are on top as the auto tower approaches the job. Before the auto reaches the scene of the work, the tower is raised by the chauffeur touching a lever at his side. When the location of the work is reached, the auto stops directly under it and the men instantly go to work.

Similarly, on leaving, the linemen formerly had to descend from the platform and cautiously lower the tower before the tower wagon could start away. Now the linemen remain on top and the chauffeur drops the tower at the same time as he starts away along the street. Time is saved at every turn, as well as labor, and the efficiency of the whole unit is increased accordingly.

Maintenance Practices on the Pittsburgh Railways

Tool Box Added to Compressor Outfit

RELATIVE efficiency of track maintenance work on the different divisions of its property is indicated to the Pittsburgh Railways by the number of car derailments, which serves as a criterion. Each division, therefore, pays particular attention to see that its track remains in good operating condition. Pneumatic tools are frequently needed in this work. The company has provided a number of Ingersoll-Rand air compressor outfits of the type shown in the accompanying illustration. These are mounted on flanged wheels and are moved over the rails from place to place by work cars. After arriving on the job, they are lifted from the rails and placed at the side of the street in some convenient location. To facilitate the transportation of the pavement breakers and tampers attached to the compressor, the company has constructed wooden boxes on top of the cars. All tools used in connection with the air compressors are carried in these boxes.

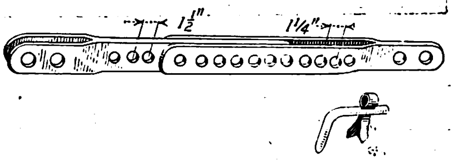


Pneumatic Tools Operated by the Air Compressor Are Carried in the Wooden Box

Pin-Type Slack Adjusters Used in Pittsburgh

INSTEAD of the turnbuckle-type slack adjuster formerly used on the Pittsburgh Railways a pin type made in the company's Homewood shop is now standard. These consist of four parts, two sliding members, a round steel pin and a cotter pin. The sliding parts are punched with equally spaced round holes. On the outside member these are at 1¼-in. centers while on the inside member the spacing is 1½ in. The pin fits these holes. With this spacing arrangement it is always possible to find a position where the pin can be inserted.

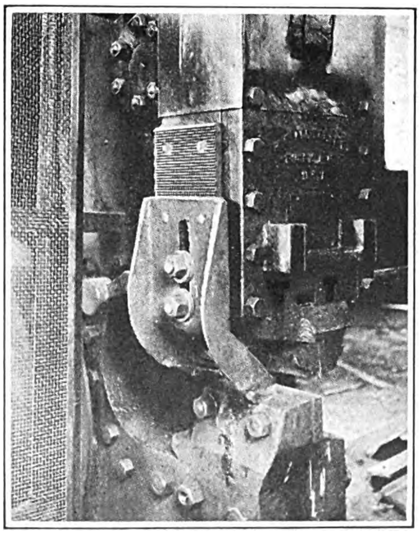
The pins are heated in a small oil rivet heater, punched and bent with a die in a pneumatic riveter. Copper for the cotter pins comes in ribbons ⅞ in. thick. This is cut into 8-in. lengths by metal shears, and then bent into proper shape by two movements of the pneumatic riveter.



Different Spacing of Holes on the Sliding Members of This Slack Adjuster Facilitates Insertion of This Pin

Guard Protects Workman Using Metal Shears

WHEN cutting long metal rods or bars in a power shears it was found in the Homewood shops of the Pittsburgh Railways that there was a dangerous tendency for the end of the piece to fly upward when pressure was applied at the center. To prevent this a guard was arranged as shown in the accompanying illustration. A short length of 12-in. channel was bent to an angle of approximately 120 deg. in the bulldozing machine. Then a serrated piece of metal was fastened to the side of the shears and a similar piece riveted to the back of the channel. Bolts were installed to hold the channel firmly in place. Its position is regulated according to the thickness of the material being cut. The presence of this heavy metal piece alongside the shears has been successful in preventing an upward movement of the pieces being cut.



Channel Iron Fastened to the Side of Power Shears Prevents Upward Movement of Pieces Being Cut

New Equipment Available

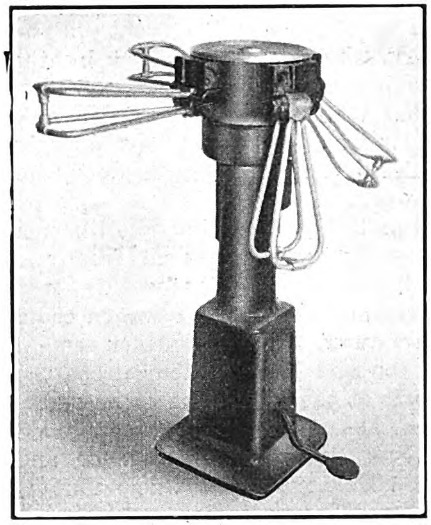
Seamless Metal Hose

FLEXIBLE seamless metal hose, made by corrugating either seamless bronze or seamless steel tube, has been developed by the engineers of Charles Cory & Sons, Inc., New York, N. Y. Methods have also been worked out for attaching fittings of standard design and thread to this flexible hose by welding. The manufacturers claim an increased life for this type of hose over ordinary types and state that it can be used not only in the entire field where ordinary hose is now used, but also for pressures up to 10,000 lb. and temperatures as high as 1,000 deg. F.

Folding Arm Turnstile

A TYPE of turnstile with arms that fold down on one side as they are rotated has just been brought out by the Folding Arm Turnstile Company, J. H. Denton, sales agent, New York City. This type of turnstile is intended particularly for use on electric cars and at locations where space for the usual type is not available.

The new design has a cast-iron base mounting, the lower part of which is arranged for installing coils or interlocking mechanism such as is used with some prepayment systems. A rotating head with four arms made of aluminum tubing fits into the top of the pedestal, and on top of this a change tray is provided for convenience of the operator. A Veeder cyclometer with dial visible through a slot in the change tray records each quarter revolution.



The Arms of the Turnstile Fold Down on the Side Not Used for Passage

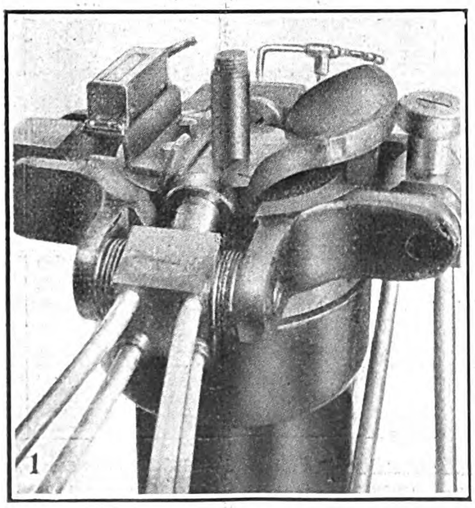
The base is 13 in. square at the bottom and tapers to 7½ in. square at the top. The round part of the base is 5 in. in diameter. With arms down, the outside radius of the revolving head is 7 in. and the radius to the end of the arms when up is 19 in. The height of the turnstile from floor to top of change tray is 3 ft. 3 in. The turnstile is intended for rotation in one direction only, but the direction may be changed by reversing the ratchet pawl. A positive stop is provided at each quarter revolution and release for the ensuing rotation is obtained by depressing a pedal. The location of the pedal in the base can be changed to suit varying conditions.

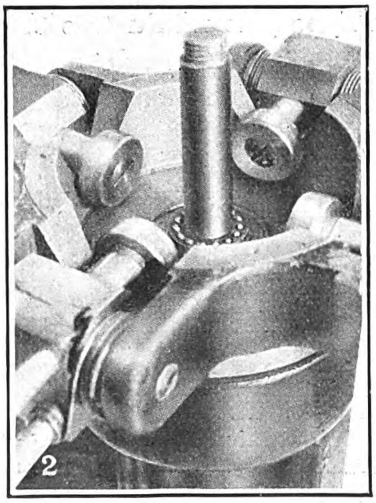
The rods which form the arms of the turnstile fit into steel blocks. These have an extension in the rear with rollers and the up-and-down motion of the arms is accomplished by these rollers sliding over stationary cams. Springs are provided on either side of each steel supporting block in order to provide for quick raising of the arms. The rotating head is provided with ball bearings at both top and bottom. These are of standard construction and can be removed as a unit. The operating mechanism lifts out from the top, so that inspection and repairs can be made quickly. The weight of the folding arm turnstile complete is about 185 lb.

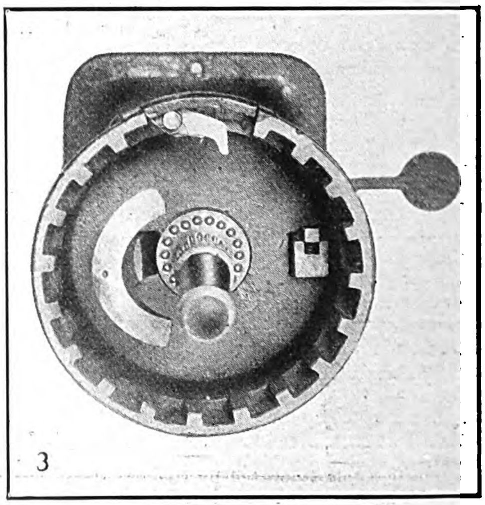
Relay Calibrated Without Removing Cover

CONSTRUCTION for calibration without removing the cover by means of a knob projecting through the glass window at the upper part of the case is a feature of a new power relay brought out by the General Electric Company. This relay is for use in limiting the power on distribution lines to a predetermined quantity. It has a large range of calibration, running from zero to 1,000 watts, secondary.

This relay is manufactured in three forms; the "IG-102," an "over power" and "under power" device with contacts for controlling either alternating or direct current, and two "over power" devices, one for alternating and the other for direct current, known as the IG-103 and IG-104, respectively. By rotating the knob at the window the relay may be adjusted for operation at any deviation from the desired load. A graduated dial, mounted beneath a fixed needle, rotates with the calibrating knob, giving visible indication of the load setting.







No. 1. Cast Steel Cams Guide the Rollers on the Inside End of the Turnstile Arm and Produce the Up-and-Down Motion.
Nos. 2 and 3. The Revolving Head Has Ball Bearings on Both Sides

The News of the Industry

City Will Buy Road

Phoenix Railway to Be Sold at Junk Value—Commission Claims Contract Is Illegal

Complications continue to pile up at Phoenix, Ariz. The city, through its commission, in a resolution unanimously adopted by its members, authorized the purchase of the equipment of the Phoenix Railway. As opposed to this the State Corporation Commission holds the proposed purchase to be illegal. If the city has its way it will purchase all the equipment and property of the company at their salvage value, to be determined by appraisers on or before Sept. 15 in anticipation of threatened suspension of service on Oct. 20. It is said that the city does not contemplate the operation of a railway but proposes to purchase the equipment at its junk value with the intention of interesting some concern in rehabilitating the system. There will be two appraisers, one representing the city and the other the company. In the case of a disagreement, a third appraiser will aid in determining the value.

Mayor Whitney, in a statement made following the session of the commissioners, said the fact that the City Commission had decided to purchase the equipment as junk was no indication that he, personally, favored municipal ownership of the Phoenix Street Railway. He said: "I am opposed to the city operating this street railway, temporarily or permanently, under any conditions whatsoever." He said if no arrangements were made to rehabilitate the system by the time that the owner, Mr. Sherman, abandoned his franchise, the city would then feel compelled to consider applications for bus franchises. The City Attorney says the city will be within its rights in purchasing the line because the franchise was granted before provisions of the charter quoted by the state commission were framed.

The Corporation Commission disapproves the agreement on the ground that it is illegal, not having been presented to the voters of the city. In accordance with the city charter, the commission pointed out, provision was made that the city could not enter into the purchase of a public utility without first having submitted the proposition to the people. The commission stated that it was not concerned with the operation of the public utility by the city, but that it did feel it should determine whether the action proposed was of a proper legal foundation.

The commission also called attention to a bonded indebtedness of $150,000 against the railway, which is a first lien against the property and which will continue as such unless some provision is made in the contract for cancellation. The commission claims that the contract leaves room for doubt as to the city's obligations and responsibilities. It further objected on the ground that no definite price was fixed in the contract for the purchase of the railway property.

Saginaw Transit Seeks Fare Boost

Petitions have been placed in circulation by representatives of the Saginaw Transit Company, Saginaw, Mich., furnishing street car and bus transportation, asking for a revision of the franchise making three-for-a-quarter ticket fares possible. The present franchise allows four tickets for 25 cents. The cash fare is 10 cents.

The company at Saginaw resumed operations in November, 1923, after a two-year period of suspension, but it did not furnish 100 per cent service until Jan. 1, 1924. The franchise terms of the new car-bus ordinance, which was approved by the voters on June 25, 1923, were reviewed in the ELECTRIC RAILWAY JOURNAL issue of July 14, 1923, page 70, and April 5, 1924.

Detroit's Mayor for Open Railway Meetings

Meetings of the Board of Street Railway Commissioners at Detroit, Mich., are to be open to the public by direction of Mayor Smith. Heretofore the policy has been to close the meetings of the commission to all except those immediately concerned, but the Mayor has requested that all future meetings be held at a fixed time and place and be open to the public.

In a letter to the commission the Mayor said:

> I desire respectfully to recommend that meetings of the Board of Street Railway Commissioners be fixed for a definite time and that a place of meeting be designated, which shall be open to the public.
>
> It is my belief the business of the Department of Street Railways should be wholly public. One of the chief factors in the decision of the people of Detroit to adopt municipal ownership as our settled policy was the belief that secrecy was not consonant with the proper operation of a public utility for the public's benefit. I believe the public is entitled to know every fact regarding the operation of its railway. I believe the public has a right to complete information regarding public business. I therefore make this recommendation.

Mail Pay Case Decided

I.C.C. Increases Rate on Independent Cars, but Keeps Pouch Service at Old Figure—Terms of Order Reviewed—Case Argued Early Last Year—Industry's Contentions Summarized

THE Interstate Commerce Commission decided the electric railway mail pay case on June 2. Under the decision there is no increase in the pouch rate, but there is a considerable increase in the independent car service rate and apartment rate. Thus, the independent car rate, for a car 36 ft. long, is 50 cents, whereas at the old rate it would have been 36 cents, and the department pays for an authorized round trip. There is also a notable increase in the apartment rate.

The post office department made a very technical analysis of costs, but made no allowance for load factor, excess mileage or excess space taken by the unit number of pouches and reached the figure of 1.87 cents per car foot-mile. After reviewing the argument on the closed pouch and other service, the commission issued an order regarding new rates, as follows:

> 1. That the present rates of pay for the transportation by urban and interurban electric lines of mail on passenger cars, on baggage or express cars, and in baggage and express compartments in passenger cars, are fair and reasonable.
>
> 2. That the fair and reasonable rate for independent cars devoted to the transportation of the mails, on which railroad employees handle the mails, is 50 cents per car-mile of authorized travel of cars 36 ft. in length, inside measurement. Where the railroad company is unable to furnish cars of the length authorized but furnishes cars of lesser length which are accepted by the department to be sufficient for the service, payment shall be made only for the actual space furnished, the compensation to be not exceeding a prorate of that provided for a 36-ft. car. Where cars exceeding 36 ft. in length, inside measurement, are authorized and used, the compensation shall be not exceeding a prorate of that provided for a 36-ft. car. In computing the car-miles of independent cars the space in both directions of an authorized round trip car run shall be regarded as the space to be computed unless the car or any part thereof is used by the company in the return movement.
>
> 3. That the fair and reasonable rate for railway postoffice cars and railway post-office apartments in cars, in which postal employees handle the mails, is 2 cents per linear foot, or fraction thereof, per mile of authorized travel in cars or apartments in cars 20 ft. or less in length, inside measurement, and in cars or apartments in cars more than 20 ft. in length, inside measurement, 2 cents per linear foot per mile of authorized travel for the first 20 ft. and 0.875 cent per linear foot per mile of authorized travel per each additional foot or fraction thereof. In computing the car-miles of full and apartment railway post-office cars, the maximum space authorized in either direction of a round-trip car run shall be regarded as the space to be computed in both directions.

A summary of the brief of the American Electric Railway Association case was published on page 664 of the issue of this paper for April 26, 1924. Briefly, it asks for a basic rate of 7 cents (for ten pouches or less) instead of the existing basic rate of 4 cents. It based its request partly on the claim that the pouches as piled took more room on the car than allowed by the department and that this represented, therefore, a larger proportion of the transportation service rendered per car-foot-mile than allowed by the department. The association also showed that the average load factor in passenger cars, i. e., the relation between passenger miles and car seat miles (plus an allowance for the revenue space on the platforms) is only 42 per cent, so that this factor should be considered in calculations of the cost per foot-mile, as should also the mileage from terminal to carhouse. With these allowances and one for handling, the rate of 7 cents was obtained as a fair basis, instead of the 4 cents at present paid.

The case was argued early last year. W. H. Maltbie, Baltimore, represented the American Electric Railway Association and certain interurban and urban electric railways, and Frank Karr and C. W. Cornell represented the Pacific Electric Railway and two other electric railways on the Pacific Coast. Joseph Stewart, special assistant to the Attorney-General, represented the Postmaster-General. The last previous mail rate schedule of the Interstate Commerce Commission went into effect Dec. 6, 1920, and the claim of the electric railways was that the rates were inadequate to meet operating expenses and an 8 per cent return on the investment, whereas the Post Office Department recommended a lower rate than at present for the pouch service and the r.p.o. apartment service. In the year ended June 30, 1923, the Post Office Department paid out $569,195 for electric railway mail service, divided as follows: Closed pouch passenger service, $320,879; closed pouch baggage service, $101,524; r.p.o. cars, $46,320; r.p.o. apartment service, $92,065; independent cars and apartment service, $8,407.

Seeks to Drop Litigation Over Eight-Cent Fare in Philadelphia

A resolution was recently offered at a meeting of the transit commission of Philadelphia, Pa., in the office of the Mayor, requesting the City Council to instruct the City Solicitor to discontinue the pending action of the city before the commission for a reduction of the temporary fare granted to the Philadelphia Rapid Transit Company. The resolution stated that the company, through the maintenance of its present earnings under the 8-cent fare, would be enabled to build up a reserve that would provide for the various extensions and improvements of the transit system which are contemplated as part of the city-company program.

The meeting in the Mayor's office was originally called to consider a proposal to take over the Frankford, Tacony & Holmesburg Street Railway, which was sold on June 19 at auction by receivers for $350,000. Both proposals were submitted to a sub-committee for consideration and recommendation. Thomas E. Mitten, chairman of the executive committee of the P. R. T., attended the meeting and, at the invitation of the Mayor, told the residents of the northeastern section of the city and the members of the commission present the program which the city and company, co-operating, could carry out if the present P. R. T. earnings were maintained.

Utility Building Dedicated at Pittsburgh

Investing a building with personality might aptly be termed the plan of procedure followed by the Philadelphia Company and affiliated corporations of Pittsburgh in throwing open for public inspection and use its new office building. Through the use of the slogan "The House of Service," the company has given the building an individuality sufficient to make it stand out prominently in the city. In the structure are to be found the headquarters of the Pittsburgh Railways, Duquesne Light Company, Equitable Gas Company, Allegheny County Steam Heating Company and various subsidiary corporations.

Pittsburgh's "House of Service"

Promptly at noon President Arthur W. Thompson, before the massed public and employees, dedicated a table consecrating the building to public service.

As a fitting climax to the opening ceremonies, a banquet was held in the roof garden of the William Penn Hotel. The guests included prominent bankers, business and professional men, public officials, representatives of public utilities from nearby cities and states, service club members, newspaper men and others of the Pittsburgh district. President Thompson presided at the dinner. Although the main banquet facilities were inadequate to accommodate all of the employees, the proceedings and speeches were made available by broadcasting the event through KDKA, the Westinghouse station.

As a fitting climax to more than 40 years of public service, the celebration incident to the dedication of the building brought prominently before the residents of the community the fact that the utilities have been performing a public service for the past forty years, with an expressed resolve to be of even greater service in the years to come.

Vote on Bus-Street Car at Lincoln

The Council of Lincoln, Ill., has passed the solution of its troublesome municipally owned railway to the electorate. Mayor Howard Engle openly termed it "passing the buck to the people." Guy LaBaw, manager of the municipal railway, went to the Council with a petition for a bus line, but after discussion it was decided to let the people vote on the question of whether they want buses or the railway. Early suspension of the railway was predicted by Mr. LaBaw as a result of the refusal of the Council to authorize him to make needed expenditures.

No Definite Progress on Buffalo Program

Scrapping of seven railway lines in Buffalo and the introduction of double-deck buses on five new lines are proposed by the International Railway as part of the city-company plan of operation now being discussed at conferences at which were present representatives of the traction company, Mitten Management, Inc., Philadelphia; members of the Buffalo City Council, the Chamber of Commerce and publishers of Buffalo daily newspapers.

Herbert G. Tulley, president of the railway, says adoption of the plan would tend to better transportation in widely separated sections of the city. Many of the car lines which the company would abandon are now operated with a one-man crew as an economy measure while city-company negotiations are in progress. Mr. Tulley said traffic congestion in many parts of the city and the increased use of the automobile were delaying the operation of street cars and speeding up the time when buses must be used for quick transportation on lines where passenger traffic is not unusually heavy during rush hours.

The application of the International Bus Corporation, a subsidiary of the railway, for permission to reroute the Delaware Avenue-Kenmore bus line was denied pending consideration of the new bus proposals in their entirety.

Arbitration at Boston Deadlocked

Up to June 25 there has been no change in the arbitration situation either on the Boston Elevated Railway or the Eastern Massachusetts Street Railway, Boston, Mass. The lawyers for both cases have daily sessions over the question of who shall serve as the third arbitrator in each case. Many men have been proposed and rejected for the office of neutral arbitrator, but these names are not to be made public.

James H. Vahey will represent the carmen in both cases, Roland W. Boyden will represent the Elevated in its case and Fred Cummings will represent the Eastern Massachusetts in its case. Practically every day Mr. Vahey calls first on Mr. Boyden to discuss with him the third arbitrator for the Elevated, then he calls on Mr. Cummings relative to a third man for the Eastern Massachusetts. They are practically deadlocked. The Boston Elevated employees have indicated that they will make some new proposition to the trustees, presumably relative to the method of arbitration, but they have not yet communicated with the trustees about it or stated what their proposition will be.

Kansas Controls the Bus

According to announcements made at Topeka, Kan., on June 20, buses operating in Kansas are subject to state regulations just as strict as those applied to railroads, electric railways and other common carriers. The Public Service Commission announced the rules effective from June 22.

Bus companies will have to file with the commission schedules giving the rates and tariffs to be charged, and no company will be allowed to change either without the consent of the commission; once a bus company gets a permit service cannot be discontinued without the consent of the commission. Licenses will be revoked whenever a line stops service for five days.

Tickets, printed to show points of origin and destination, and fares charged will be required and regular freight schedules will have to be presented to the commission for approval.

The rules also provide that the drivers of all buses carrying passengers must be not less than 21 years old, of good moral character, must be physically fit and must have had at least two years experience as chauffeur.

The commission will check the finances of all companies operating buses within the boundaries of the state. All companies will be required to obtain permission from the commission to issue stocks, bonds or notes, and will be required to submit both quarterly and annual reports of operations and financial condition. The following information must be incorporated in each quarterly report:

Revenue and expenses during the preceding quarter.

General financial statement of assets and liabilities.

A report of the amount involved in, and the nature of all claims pending, if any, and the status of the claim at the time of the report.

Number of passengers and tons of freight carried during the preceding quarter.

Make of each vehicle, with capacity and number of miles operated.

Any additional information that may be called for by the commission at any time.

There are 41 principal rules, each of which is subdivided into additional rules. The rules also make provision for damage insurance based on the size of each coach and the number of passengers carried at capacity load.

The rules were promulgated as a result of legislation passed at the recent session to put buses under the jurisdiction of the commission.

Chancellor Upholds Act of Tennessee Legislature

"I am constrained to dismiss the bill and to hold that the act is valid and the law of the land." In this manner did Chancellor John R. Aust in Chancery Court recently dispose of the case of M. S. Adams against the Nashville Railway & Light Company, in which the complainant had brought suit against enforcement of the law prohibiting the use of one-man cars in any city of Tennessee having more than 30,000 population. The complainant averred that he was a stockholder in the defendant company and that therefore he was materially interested in the matter. He asserted that for the company to comply with the act would cost $150,000 for initial equipment and an annual increase of $75,000 in operating expenses. The answer of the company admitted the allegations of facts contained in the complainant's bill.

Chancellor Aust said that the act was passed by virtue of what the Legislature conceived to be a proper exercise of the police power. The question was not one, therefore, of power, but whether or not a rightfully possessed power had been properly exercised. An appeal was taken to the Supreme Court.

The decision in Nashville is directly opposite to the finding at Knoxville. There Chancellor Brown declared the act unconstitutional and enjoined the Knox County sheriff and Attorney-General from enforcing it, pending the outcome of an appeal. Attorney-General Thompson of Tennessee is a party defendant in the suit brought by the Knoxville Power & Light Company.

Shipment Sent by Electric Railway Meets Emergency

What is believed to be a speed record in delivery of special track materials to the Community Traction Company, Toledo, was made recently in connection with the Summit Street extension track-laying job.

The concrete slab put in a year ago by the contractor when half of the base for the track was laid and half of the pavement base put in was found by mistake to have only 8-in. clearance to the top of rail. This would not accommodate the 6-in. rail and 3-in. tie. Therefore the work was held up.

P. J. O'Neill, railway engineer of the company, telephoned for the special material to a Cleveland concern at 1:32 p.m. on June 10. This order was completed at 4:50 o'clock that same afternoon, shipped by electric railway freight on the Lake Shore Electric Railway to Toledo, arrived at 7 a.m. on Thursday and was in the track by noon of that day.

The local railway men believe this is a real case of co-operation and that it also demonstrates the rapid freight facilities of electric traction which merit the support of all urban railway properties and the manufacturers in the field.

Tune in on WCAP for a Treat!

On Monday, June 29, between 8 and 9.30 p.m. the electric railway industry throughout the country as well as the general public will have an opportunity to judge of the success of a railway in developing musical talent within its ranks. At that time the band, the male chorus, and the ladies' chorus of the United Railways & Electric Company of Baltimore will broadcast a program from Station WCAP, Washington.

These musical organizations have been trained by the United Railways in line with its policy to encourage the family and social spirit among its employees. Each of them has appeared publicly on various occasions, but this is the first time they have all appeared on the same program, and the first time any of them has broadcast from one of the major stations.

The band was organized about seven years ago and was trained by its present director, B. O. Belt, a capable instrumentalist, who is a dispatcher at one of the United's carhouses. Practically all the members of his band are from the transportation department. The band's first active experience was in connection with Liberty Loan sale meetings throughout the city during the war. It has given many public concerts, participated in a number of parades, and was taken to the national Rotary convention by local Rotarians a couple of years ago.

The male chorus is composed principally of men from the transportation departments and the shops. It was trained and is directed by John P. Tingle, secretary to President Emmons. Mr. Tingle is choir director of the Pro-Cathedral of the Protestant Episcopal Diocese of Maryland. He also directs the ladies' chorus, the most recently organized musical body of the United. It is composed of young ladies from the general offices of the company.

In all about 100 vocalists and instrumentalists will go to Washington in special cars to participate in the broadcasting program. A well rounded program has been arranged with something of interest to everybody. In announcing the program the railway company said it would appreciate hearing from any of its friends who listened in.

President Emmons Not a Bit Disconcerted

Rockford City Traction Again Wins Franchise

Members of the City Council of Rockford, Ill., by a ballot of nine to seven have voted a third franchise to the Rockford City Traction Company. The two previous ones were lost, one in a referendum and the other by a mayoralty veto. As voted by the Council, the franchise prohibits operation of one-man cars, assesses track paving costs against the utility, assesses one-third of the costs of a new State Street bridge over Rock River against the utility, requires the company to lay grooved rails in all new construction, prohibits the utility from taking advantage of any terminable franchise legislation that may be enacted by the Legislature and provides means whereby the city can become owner of the line under certain conditions.

Indications were that Mayor Hallstrom would sign the ordinance, or at least let it become effective without his veto. The railway has 60 days in which to accept or reject. Arthur D. Mackie, special representative, stated that the company could not accept the franchise with its "objectionable" features, but added that he would pass it to the owners without recommendation.

On the other hand, the City Council has definitely shelved proposals of Messrs. Mordaunt and Stedman and the City State Investment Company, sponsors for the Rockford Transportation Company, which advanced a plan intended eventually to develop into municipal ownership.

San Francisco Municipal Railway Outlook

M. M. O'Shaughnessy, city engineer of San Francisco, Cal., says that at the present time there are no surplus funds, either from the sale of bonds or from earnings of the San Francisco Municipal Railway, nor does the present rate of fare show a possibility of surplus funds in the immediate future. Under these circumstances he says the only way to secure Municipal Railway extensions is through the issuance of bonds. According to Mr. O'Shaughnessy, this matter has been frequently discussed, but action has been deferred by the board of supervisors on the grounds of waiting for the outcome of the negotiations for the purchase of the Market Street system.

These and other comments are contained in the report of Mr. O'Shaughnessy to the city for the fiscal year ended June 30, 1924, an illustrated booklet of 112 pages just made public. According to him nothing of a constructive nature has been done the past year toward the acquisition of the properties of the Market Street Railway. A valuation of this property was made by his office during 1921, and all legislation necessary to take over the entire property was provided by a public election held in November, 1923. He says the importance of reaching a definite settlement of this question has been pointed out in several previous instances, but that the dual ownership, with pending acquisition of the private corporation, makes it difficult properly to expand the municipal system.

Negotiations between the city and the Market Street Railway have been in the hands of a special committee, appointed by the Mayor, of Supervisors and other city officials.

Higher Fares Predicted for New Orleans—Loan Studied

R. S. Hecht, chairman of the board of directors of the New Orleans Public Service, Inc., New Orleans, La., recently declared before the railway wage arbitration board that the company could not get along on the reduced carfare it agreed to three years ago if it were forced to increase its payroll. The company is seeking a wage reduction.

Mr. Hecht said the 7-cent carfare had cost the company more than $1,000,000 in three years, this being the difference between the allowable rate of return and the amount that had actually been realized. He said, further, that the company had continued on the reduced rates because of its desire to deal fairly with the public in the hope of later getting the benefit of the extensive improvements now being made.

The New Orleans Public Service has sought authority to issue $5,000,000 in bonds for improvements already made or contemplated. It is stated that the city authorities will, before giving a final answer to the request, order that the company show the Commission Council in detail just what the $5,000,000 is required for. Further, that in case the city does give its approval, it is understood that the money from the bonds be added to the rate base, on which the company is allowed to earn 7½ per cent, only as it is actually expended dollar for dollar in improvements.

Safety Stressed in Montreal

Demonstrations in accident preventions were included as part of the program of the Province of Quebec Safety League in its celebration of Safety Week, June 7-13. At the invitation of the Mayor of Montreal about 500 public-spirited citizens attended an inaugural dinner meeting on the first evening of the week to listen to interesting talks on accident prevention. In addition to advancing the cause of safety during the week the league conducted a $50,000 campaign seeking generous subscriptions for "the life of one near and dear to you." Such a fund, according to the literature printed for distribution during safety week, would cover a two-year budget, would save 25 to 50 lives a year, prevent innumerable serious injuries and save much money in property damages. Subscription forms were prepared, with blanks, to fill in the amount of money to be turned over to the league "as evidence of my interest in the educational service rendered the community by the Province of the Quebec Safety League in its endeavors to prevent accidental fatalities." Arthur Gaboury, formerly of the Montreal Tramways, is general manager of the Province of Quebec Safety League, Montreal.

Minority Rejects Chicago Elevated Wage Proposal

The smooth trend of the wage negotiations in Chicago has been broken by an adverse vote on the scale of the elevated employees. The "L" employees, who always vote on their scale after the Surface Lines union men have signed a new agreement, gave labor leaders no less a shock than transportation men by returning a negative vote on terms similar to those already ratified by the larger union embracing the street cars.

Company officials were in a quandary over the sudden reversal, but were equally surprised to find in the organ of the Amalgamated in Chicago a complete explanation of the vote that amounted almost to an apology.

The labor editor revealed that the vote represented only 27 per cent of the membership of the local and continued to say that the small attendance was due to the general apathy to union agreements that comes with contentment. Most of the men, the editorial said, had taken it for granted that whoever went to the meeting would, as usual, vote for the agreement submitted, as had the Surface Lines unions.

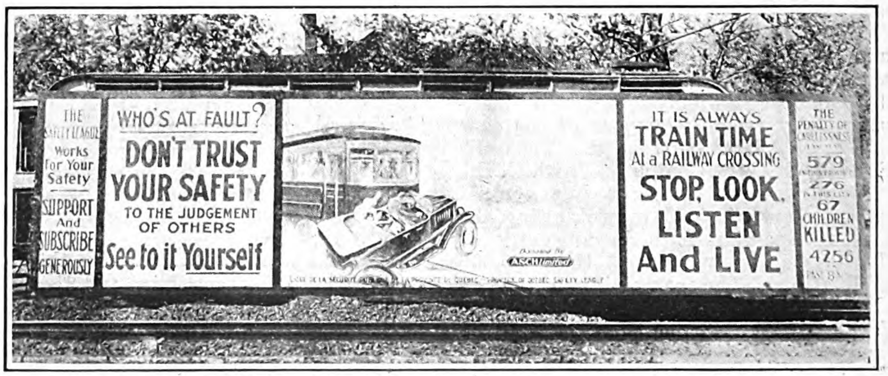
Company and union officials are conferring about the best line of procedure to put the agreement to another vote. Except for minor working conditions, the terms are the same as those existing previously.

B. J. Fallon, general manager of the elevated, conferred with John Bruce, union president, and a committee on June 25. Mr. Fallon made it plain that no increase would be granted.

"There is absolutely no chance," said Mr. Fallon.

"We haven't the money, and there is no money in sight."

The scale is 77 cents for motormen and 71 for guards.



Car at Montreal Carrying Safety Message

Cincinnati Franchise Advanced to Printing Stage

So far have the conferees advanced toward final agreement as to terms of a new traction franchise for Cincinnati, Ohio, that it has been decided to print the document for submission to the City Council with blank space only for the insertion of two comparatively unimportant items. These are whether tickets shall be sold in strips of six or in strips of six and three and whether the cash fare shall be 10 cents or 9 cents. These questions will have to go back to the directors of the Cincinnati Street Railway, but the sentiment seemed unanimous for tickets in strips of both three and six at the rate of 8⅓ cents and a cash fare of 10 cents.

The new ordinance will contain no provisions regarding buses. The present idea of City Council leaders is that a distinct standing committee on buses shall be created to consider all applications for the reestablishment of bus routes and report back to the Council, as does the present street railroad committee on applications for the establishment of new street railway routes.

It was announced that the board of directors of the street railway consented to a provision fixing the return on capital stock for the first three years of operation under the new franchise at 5 per cent with 6 per cent thereafter. It constitutes a surrender of one-sixth of the dividend for three years, something that was insisted upon by members of the Mayor's traction committee.

Railway Participates in Bridgeport Progress Week

"Progress Week" was held in Bridgeport, Conn., from May 30 to June 6. It brought a large attendance. Some 200 concerns exhibited their products and merchandise. One of the most interesting and extensive exhibits was furnished at the booth of the Connecticut Company. A working model of a power house was shown with overhead traction wires, permanent tracks and passenger and freight cars in continuous operation thereon. Large blueprints were exhibited to give an example of the life-time growth of the company. In 1894 it was seen that the Connecticut Company operated only 46 miles of track compared with 1,042 miles of track today. A model pioneer locomotive, used in Derby and Ansonia in 1888, illustrated the idea of the first attempt to haul freight by electric power. The overhead wire was an exact reproduction of the heavy cables used on all lines. It was manufactured by the Bridgeport Brass Company of Bridgeport.

Motorman Pate Forgot—One Killed, Fourteen Injured

One man was killed, one seriously hurt, a dozen or more passengers were injured, two interurban cars burned and a trestle was destroyed as the result of forgetfulness on the part of Clarence H. Pate, operator of a one-man interurban car on the Prospect or River Road line of the Louisville & Interurban Railroad, a subsidiary of the Louisville Railway, on the evening of May 26. Pate's orders were to await at Harrodscreek siding to let an outbound car pass him. Instead he came on toward Louisville, and on a trestle across Goose Creek, his car met head-on that of William F. Edwards. Vestibules were telescoped to the front rows of seats within the cars. Motorman Edwards was pinned in the wreckage and burned to death in the fire that followed the collision. Fourteen passengers were injured. Motorman Pate suffered a broken collarbone.

As he saw the other car rushing toward him Pate is alleged to have exclaimed: "My God, I forgot." Company officials announced that the accident was due to Motorman Pate's failure to follow instructions.

Both men had been with the company for years.

Strong Case by Dissenting Arbitrator

Although Overruled, Representative of Atlanta Company in Recent Wage Dispute Laid Down Statement of Sound Economic Doctrine—Digest of Opinion

C. M. CANDLER'S dissenting opinion in the recent wage arbitration at Atlanta, Ga., has been the cause of no little comment in Atlanta and elsewhere in the South. His contention was that a living wage for the employee could be met only by a living wage for the employer. Mr. Candler represented the Georgia Railway & Power Company on the board of three to whom the matter was referred for settlement. His associates were Edwin F. Johnson and Luther Still.

As explained recently in the ELECTRIC RAILWAY JOURNAL, Messrs. Johnson and Still granted an increase of 3 cents an hour to motormen and conductors and of 6 per cent to other employees. This made the scale for motormen and conductors 46 cents an hour for the first nine months of service, 51 cents for the next nine months of service and 54 cents thereafter, effective as of May 1, 1925, to continue through Dec. 31, 1925, or as long thereafter as may be mutually agreeable to the company and the association, except that notice in writing may be given at least ten days in advance of a desire on the part of either the association or the company to negotiate a new wage scale after Dec. 31, 1925.

Under an agreement similar to the one under which the board recently acted the same three individuals on March 24, 1924, by a majority vote (Messrs. Johnson and Candler for, with Mr. Still dissenting) fixed a scale of wages to apply during the entire calendar year 1924. Under dates of Dec. 30, 1924, and Jan. 1, 1925, the company and the employees agreed to continue the scale in force into the year 1925, without any definite term, subject to ten days notice. In the meantime the employees made a demand for increases in the 1924 scale, and, the parties failing to reach an agreement by negotiation, on April 13 entered into the agreement. In other words it was only a little more than a year since the scale carrying increases of approximately 7 to 10 per cent was prescribed. Mr. Candler said that the question which logically arose is: Have conditions which entered into the consideration of proper wages in March, 1924, so materially changed in May, 1925, as to require or justify an upward revision of the scale?

The evidence submitted at the hearing was largely confined to this question. It was contended by the employees that the cost of living in Atlanta had increased materially since the last arbitration. Evidence in the form of retail food prices quoted by two retail grocers in Atlanta on a limited number of articles for one day only was submitted in support of this contention. The company submitted estimates as to the cost of living in Atlanta made by the United States Bureau of Labor and also by the National Industrial Conference Board. From all the evidence before the board, Mr. Candler was of the opinion that the cost of living in Atlanta, in so far as it entered into a consideration of wages, had not increased so materially over March, 1924, as to justify the increase in wages awarded by a majority of the board.

Mr. Candler also disagreed with the contention by the employees that traffic conditions in Atlanta had grown so bad that the services of trainmen were performed under greater nervous and mental strain. He said the recent establishment of stops at numerous traffic boulevards, the elimination of jitneys from streets upon which cars are operated and other traffic regulations adopted during the past year would rather tend to render street car operation safer and offset the possible effect of any slight speeding up of schedules in non-congested sections.

During the hearing the probable effect of jitney elimination upon the company's revenues was discussed. In Mr. Candler's opinion the effect for a year or any fair period of operation can only be estimated, not with such certainty as to justify the imposition of a large, definite, additional expense burden upon the company. In conclusion he said:

> It must be borne in mind that a public utility occupies an entirely different position from that of a private industry. If the wage scale of a manufacturer is increased he offsets the increase by a corresponding increase in the selling price of his products. If because of competition or for other economic reasons this cannot be done, he can suspend operations until conditions are improved, or quit business altogether, or remove to some other more favorably located city.
>
> The utility cannot increase its rate; it cannot remove to another city; it must go on at the rates fixed by the public, operate under regulations prescribed by the public, and in the case of the Georgia Railway & Power Company pay wages fixed by arbitration.
>
> I concede that the cost of living has a place in the consideration of a wage scale, but I also contend that the ability of the railway to pay wages must enter into the consideration. A living wage for the employee can only be met by a living wage for the employer.
>
> The company submitted evidence show-

ing that its railway net earnings were approximately $273,000 less in 1924 than in 1923, and less for the first three months of 1925 than for the same period in 1924, failing by $118,000 to meet interest charges alone. No evidence was introduced to discredit these statements of actual results.

The company contends that the wages now in effect have been and are sufficiently attractive to bring to it many applications for employment, approximately 600 having been made since Jan. 1, 1925, only 80 of which could be accepted as railway trainmen. This fact would indicate that the railway service and wage must be equal to or even more attractive than employment in other lines open to the employees.

The evidence submitted further showed that of 41 street railways in the South, only three pay higher wages than are paid in Atlanta; two pay the same top wage as Atlanta and 35 pay lower wages than Atlanta. It was further shown that the average top wage of these 41 companies is 45.7 cents an hour as compared with 51 cents in Atlanta, in effect at this time, or 54 cents as fixed in this award.

Taking into consideration the entire record of this arbitration, I am of the opinion that conditions in Atlanta affecting railway wages do not require or justify any increase in the existing scale and that the same should be continued in effect through the year 1925.

More Subway Routes Validated in Brooklyn

Borough President Maurice E. Connolly of Queens swung into line for Mayor Hylan's proposed $542,000,000 independent municipal subway on June 19 and the Board of Estimate validated the Queens routes proposed by the Board of Transportation with one slight change and with one proviso by Mr. Connolly. The change was the inclusion in the Board of Transportation's plans of the so-called Steinway loop. The loop will be about half a mile in length and will cost about $3,000,000 additional. Mr. Connolly announced that he would vote for approval of the route, but added that, when it became time to appropriate money for construction, he would insist that the line in Queens Boulevard be built as a covered subway. This will cost $20,000,000 additional.

The action by the board completed the validation of all the routes proposed by the Board of Transportation for Manhattan, the Bronx and Queens. As Richmond has no place directly in the city's proposed subway system, that left only the Brooklyn routes unvalidated. The matter of the Brooklyn routes will be considered on July 1.

Beaver Valley Veterans Serve 500 Years

Of the frequent and varied publicity of the Beaver Valley Traction Company no advertisement touched a warmer spot in the hearts of the men and the public than the full page announcement in the Beaver Falls *Tribune* recently, entitled "500 Years Training to Serve You." The introductory box at the top read:

> There can be no greater evidence of loyalty and success of endeavors to please than that exemplified by length of service. Here we present twenty-four members of our personnel whose years of service total more than 500.

The illustrations comprised portraits of operators, flagmen, dispatchers, shopmen and others who had served from 16 to 25 years. The center of the page showed a drawing of the latest double-truck safety cars ornamented with the portraits of John R. Marshall, superintendent of transportation (24 years) and W. F. Allshouse, track foreman (24 years). The ad concludes:

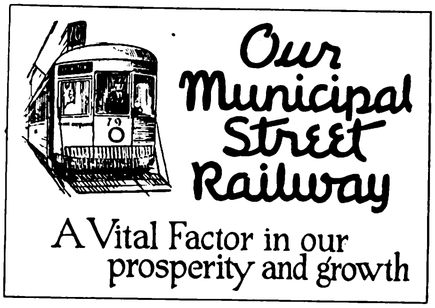
> We view the public as our friends and patrons and know that in the degree that we serve depends our progress, the progress of this company and the community.—Employees Beaver Valley Traction Company.

Owing to the popularity of the announcement, the advertisement was reprinted by C. D. Smith, general manager, on special paper for display in the homes of employees and others who wished to have a more permanent record than the newspaper publication.

Importance of Railway Told in Seattle Advertisements

The Seattle Municipal Railway, Seattle, Wash., has started a six months advertising campaign in the Seattle daily newspapers. The advertisements will appear in each of the four daily newspapers each week. An appropriation of $10,000 from the railway funds was made by the City Council a month ago to be spent under the direction of Clark R. Jackson, superintendent of public utilities, to stimulate travel. The contract for handling the advertising has been let to a local agency.

The campaign will deal with the importance of the railway to the city in promoting its growth and prosperity, the need of extensions and adequate service to stimulate the growth of industry, commerce and population and the measure of success attained in six years of municipal operation.


Our Municipal Street Railway
A Vital Factor in our prosperity and growth

Seattle Advertises to Stimulate Traffic

The public will be reminded of all of Seattle's scenic districts and beauty spots and advised as to how they may be quickly and comfortably reached by street cars, so that both residents and tourists may be aware of the large number of sightseeing trips possible by street car. In the Seattle Times of May 18 the following message was given to the public:

> Few Seattle citizens, to whom rapidly moving street cars are a common sight of daily life, realize the important part the street railway system has played in the development of the city and its vital relationship to our present prosperity and our future growth.
>
> Few who ride on street cars daily ever stop to think that Seattle would be a small saw mill center huddled along the waterfront today had not the street railway system, from the early days of the city, constantly stimulated the city's growth by extending car lines and furnishing the rapid transportation necessary to growth of industry, business and population.
>
> Without the street cars, to get people rapidly from their home to work and about the city on their business, Seattle would have stagnated, instead of becoming the wonder city of the continent, for rapid transportation is the most important element in the growth of modern cities. Without the street cars industries and population would have located elsewhere.
>
> What is true of the past is true of the present and will continue to be true in the future. Were street car service, the main means of rapid transportation, discontinued tomorrow, the productive capacity of Seattle's industry, business and citizens would be so reduced as to cause disaster to all.
>
> If Seattle's street car service is not extended to meet the needs for growth of our industries, commerce and population, the growth we are enjoying will be retarded and Seattle will be robbed of its destiny as a great world city.
>
> The real interest of Seattle citizens in the Municipal Street Railway System is not political but economic; on its successful operation and adequate service their individual prosperity largely depends. Its welfare is of personal interest to every one of them.
>
> The Seattle Street Railway System, though successfully operated, has its problems. They are problems of public service which the individual citizens can help largely to solve. Following this announcement, we shall invite, through the newspapers, the help of Seattle citizens in solving some of those problems. It is your street railway and we invite you to give it your thought.

Central Interurban Station at Kansas City Unlikely

The project of a central interurban station in Kansas City, Mo., to cost the Interurban Central Station Company $3,000,000 appears about to fade into oblivion. C. C. Peters, president of the company, said that it is hard to foresee just what will happen. The City Council passed a franchise on Jan. 6, 1918, authorizing the company to build a station at Tenth Street and McGee Trafficway. The company posted $50,000 to guarantee that the station be built by Feb. 7, under an extension of the time fixed in the original ordinance. The Kansas City Railways was a party to the contract with the city, but the receivership of that company presented a further obstacle.

Definite plans were outlined on two occasions since the passage of the ordinance, but each time construction of the station was blocked by new obstacles. There has been little or no mention of the project recently, but there was much agitation for a central station following 1914. It is possible the plans may go forward, but much is said to depend upon how the court regards the railway agreement section of the franchise. Hughes Bryant, building adviser to the railway, is said to have expressed the opinion that the expenditure of a large amount of money in the construction of an interurban station is inadvisable under present conditions.

The site is now being used as a parking station at an annual rental of $20,000, enough to care for the taxes and all expenses of the property.

New Competition—Planes Between Springfield and Dayton

Hourly airplane passenger service between Springfield and Dayton, Ohio, will be started June 29. The flights will be made between Tecumseh field and Avondale field at Dayton, and planes will be able to transport two passengers and their luggage each trip.

Tecumseh flying field is 4 miles west of Springfield in the National road and is reached by buses of the Columbus Dayton Transportation Company on the Dayton route. The buses also pass Avondale field in Dayton.

Recent Bus Developments

Chicago Surface Lines Proposes Auxiliary Service—Pittsburgh Status Explained—First Interurban Auxiliary in Utah—Activities in Other Cities

THE first definite step to use the motor coach for auxiliary service has been taken by the Chicago Surface Lines in a proposal made to the city to forego the franchise requirements for this year's track extensions and substitute pneumatic-tired buses.

While the city claims the right to stipulate more than 20 miles of trackage extension a year, only half that amount was asked for by the local transportation committee of the City Council this year. The Surface Lines has $800,000 available and informed the Councilmen that this would build less than 10 miles, but that good service could be provided to outlying communities at less expense if the company bought several hundred buses instead of putting down track in sparsely settled communities.

The final authority in the matter is the Illinois Commerce Commission. No agreement has been reached between the city and company, but it is expected that at least part of the extension program will be dropped and the territory experimentally served by bus.

The City Council of Watertown, N. Y., recently granted the request of the Black River Traction Company to rescind its franchise on High, Factory and Pearl Streets, and at the same time granted the request of the Watertown Transportation Company to acquire the franchise to operate buses over these streets. Leon Schwerzmann, superintendent of the company, furnished statistics to show that this branch had eaten into the profits of the main line. In answer to the arguments of the New York Air Brake Company employees that the line must have paid during rush hours and that the line was needed by employees of the industries, Mr. Schwerzmann said the company would be glad to give the High-Pearl Street branch to them. All they would have to do would be to buy a couple of cars and furnish the power. He said the traction company would agree to accept transfers under an order of the Public Service Commission. The matter will now have to go before the Public Service Commission for its action. The petition of the company was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 23, page 829.

The interests that control the Pittsburgh Railways, Pittsburgh, Pa., will also control the buses, but the two will be conducted under different supervision. This statement was recently made by Thomas Fitzgerald, vice-president of the company, in announcing that preliminaries were now going on between the incorporators of the Pittsburgh Motor Coach Company and the Traction Conference Board, which would eventually decide the relations of the buses to the street cars. He said the bus experiment will start soon after an agreement is entered into with railway officials, board members, the Public Service Commission and officials of the coach company. There were a number of reasons why the Pittsburgh Railways could not operate buses, but the principal one was that the railway, just out of receivership, had not the credit to finance the purchase of equipment. He said that the value of the bus line was in its co-ordination with the railway; that where the cost of installing tracks, power plants and other expensive equipment was not warranted buses might sometimes be used to advantage.

The Utah-Idaho Central Railroad, operating an interurban railroad between Ogden, Utah, and Preston, Idaho, has applied to the Public Utilities Commission of Utah for a certificate of public convenience and necessity for the operation of a passenger and freight automobile stage line between Ogden and Logan, Utah, a distance of about 50 miles. The petition sets forth that such service would enable it to serve the public more adequately. It is asked that the certificate shall provide that "in all cases of bad roads or inclement weather, and when, from causes beyond its control or otherwise, it is impossible or impracticable to operate motor vehicles over said route, it be permitted to furnish said transportation service over its existing lines of railroad, so as to carry on uninterrupted its transportation service between the points named at all times during the year." This is the first instance, so far, in the State of Utah where an interurban railroad has applied for permission to operate an automobile stage line as an auxiliary to its railroad service.

The Reo Motor Car Company, Lansing, Mich., has established a fellowship in highway transport to be devoted to investigations under the direction of the division of highway engineering and highway transport of the University of Michigan, covering an approved subject relative to the utilization and operation of buses. The Reo Motor Car Company fellow will make investigations relative to the economic fields of bus transportation and efficient methods of operation for urban and intercity bus systems.

Selectmen of Millbury, Mass., have made known that no permits to operate buses between Worcester and Millbury will be granted this year, even to the Worcester Consolidated Street Railway. The Selectmen have ruled that the present railway service is sufficient. The Selectmen contend that if permits were issued the town might lose $14,000 in taxes now received from the Worcester Consolidated Street Railway.

Railway service has been supplemented by city bus service on the Wisconsin Power & Light Company's south side line in Sheboygan to determine which of the two methods is the more acceptable to patrons. If the trial bus service handles the traffic sufficiently cars will be taken from service on the south side. Buses will operate on the same schedule as the cars, at the same fare.

The City Council of Champaign, Ill., recently took the first steps to authorize bus service in the city by the Illinois Traction System when it passed an ordinance permitting the use of certain streets for bus operation. No routes have been designated. Transfers from bus to bus and from bus to street cars will be authorized. The railway plans to spend $150,000 for equipment, including a new garage.

It is said that an ordinance is being prepared by the Meridian, Miss., City Council to supplant the railway service of the Meridian Light & Railway Company by buses. At the request of the Mississippi Power Company, which recently acquired the traction property, the question is to be submitted to qualified voters at an early special election.

Four feeder routes, each about 1 mile long, will be started by the Omaha & Council Bluffs Street Railway, Omaha, Neb., as soon as delivery is secured on five White buses with Weir bodies. The company has recently been granted an increase in fare, as related in ELECTRIC RAILWAY JOURNAL for June 20, page 989. Transfers will be given free between trolleys and buses.

The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is operating a new bus route on an hourly schedule between the Dempster Street terminal of the Niles Center line and Desplaines and at slightly longer intervals between Wauconda and Lake Zurich, popular northern Illinois summer resorts. The line is 29 miles in length. The running time is one hour and 25 minutes. The North Shore Line is operating special chartered coaches as well as regularly scheduled summer tours, as last year, the tours being of one, three and five days duration.

T. W. Wilson, vice-president and general manager of the Wilmington & Philadelphia Traction Company, Wilmington, Del., recently announced that the Delaware Bus Company, which is owned by the same interests that own the traction company, has purchased the Red Arrow Bus Line, Inc., operating between Wilmington and Marcus Hook, Pa. Mr. Wilson said that as soon as arrangements could be perfected through bus service on a frequent schedule would be operated between Wilmington and Chester.

An increase to 10 cents single fare and 7½ cents by book and 6 cents for school children is to be put into effect by the City Transit Company, operating the local bus service in Pomona, Cal. The bus company lost much money during six months operation and threatened for a time the abolishment of the service. Following several years of operation at a considerable loss the Pacific Electric Railway was allowed last year to discontinue electric railway service entirely in Pomona, following which the City Transit Company undertook to render a bus transportation service.

The application of the Audubon Motor Bus Transportation Company of Yonkers, N. Y., for modification of an injunction which prevents it from operating on Central Avenue, Yonkers, was denied on June 19 by Supreme Court Justice Arthur S. Tompkins. Two months ago the Yonkers Railroad got the injunction against the bus company, alleging that it held exclusive franchises for operation on Central Avenue. In its petition the Audubon company sought permission to run buses only for members of the Central Taxpayers and Improvement Association of the Ninth Ward of Yonkers. The company asked for permission to operate only two buses in the morning and two in the evening. Members of the association joined in the petition. Justice Tompkins ruled that any modification of the injunction would work an unnecessary hardship on the electric railway.

The New York State Railways has added another link to its rapidly expanding bus system in western New York by the purchase of the Rochester-Holcomb line from Joseph H. Haf, Detroit. The line is to be extended to Penn Yan, 60 miles south of Rochester and in the heart of an extensive dairy and grape belt. The Haf interests have operated between Rochester and Holcomb for the past few months following purchase of the line from the Iroquois Motor Trails Corporation.

The Geneva, Seneca Falls & Auburn Railroad is considering supplanting its Geneva-Seneca Falls, N. Y., electric railway line with buses. Paving improvements in the village of Waterloo are said to have precipitated this scheme. The railway, it is declared, has been a losing venture for several years under the present operation.

Permission to extend its service by operating a bus line between Cincinnati, Ohio, and Indian View is sought of the Ohio Public Utilities Commission by the Cincinnati, Milford & Blanchester Traction Company. The bus line would connect downtown Cincinnati with the company's traction lines at Indian View.

The bill passed by both houses of the Legislature to give the Wisconsin Railroad Commission the right to order railways to operate buses in place of street cars has been vetoed by Governor Blaine. In his veto message he maintained that if the bill in question became a law it would make bus transportation practically a monopoly under regulation by centralized authority.

The bus line now being operated by the Philadelphia Rapid Transit Company, Philadelphia, Pa., from the Navy Yard to Broad Street and the Boulevard was extended recently to Broad Street and City Line. This extension has been made possible by the delivery of additional new double-deck buses. The fare for the entire trip, a distance of more than 13½ miles, is 10 cents, with the privilege of exchanging to and from all connecting surface car lines for an additional 3 cents. The buses are of the semi-inclosed top type, seat 67 passengers, are equipped with front exit, inside stairway and electric drive.

News Notes

One-Man Cars Meet Emergency.—Officers of the New York State Railways in Syracuse report that the experiment of running one-man cars on Sunday on the Salina Street route, the busiest in the city, was successful in its initial test and will be in force indefinitely. B. E. Tilton, vice-president and general manager, said eleven one-man cars were substituted for a like number of full-crew cars throughout the day, giving adequate service.

Fare Schedule Under Consideration.—The Illinois Power & Light Company, operating the Quincy railway system, apparently faces a fight in the Council to secure approval of its proposed tariff increases. The resolution and schedule of fares, referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 20, page 993, was laid over for consideration with an evident spirit of opposition among the Councilmen. The difference in fares for street cars and the buses the company proposes to establish brought some censure. A 10-cent cash fare with five tickets for 35 cents and $1 books of 40 tickets for children are basic rates proposed by the traction system.

Fares Increased.—Fares were increased from 7 to 10 cents on the lines of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa. This announcement was made recently by the City Council after Chicago auditors had reported on the audit of the books. It showed that unless the fares were raised the company would have a $35,000 deficit at the end of the year. Under the new rate the company will show a balance of $20,000, enough to pay a 5 per cent dividend, at the end of the year, it is claimed.

Wage Increases Provided.—The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has signed a new two-year contract with its employees providing for wage increases for nearly every group. An increase of 2 cents an hour this year for trainmen and an increase of 1 cent again in 1926 are provided. This makes the new scale 74 cents for 1925 and 75 cents for 1926. No changes were made in working conditions.

Court Sustains Commission's Order.—Judge Mann in Circuit Court recently sustained an order of the Arkansas Railroad Commission forbidding the Fort Smith Light & Traction Company from abandoning 1 mile of its line from Van Buren, Ark., to the Falcon Zinc & Smelting Company mine. Van Buren is only a few miles from Fort Smith.

Champions in First Aid.—The first aid team of the Chicago Rapid Transit Company, Chicago, Ill., won the state championship in competition with five other public utility teams on June 19 for the second successive time. It was the second annual championship contest held under the auspices of the Chicago chapter of the American Red Cross. The winner had an average of 99.20 per cent for the five problems. The training of the champions was under the direction of Dr. Hart E. Fisher, company surgeon.

Eight Cents in Leavenworth.—Authority for the Kansas City, Leavenworth & Western Railway to charge 8 cents fare in Leavenworth, Kan., was granted in an order handed down recently by the Public Service Commission. The old rate was 5 cents. The buses are charging 8 cents. Now the street car fare also is 8 cents, two tokens for 15 cents.

Franchise Changes Awaited.—The Greater Cleveland Transportation Commission is expected to report within the next few weeks recommending changes in the Cleveland Railway franchises as they affect the operation of the company's lines in the city of Cleveland and in Lakewood, East Cleveland and Cleveland Heights, Ohio.

Freight Lines Started.—Three electric railway companies, the Pittsburgh, Harmony, Butler & New Castle Railroad, the Pennsylvania & Ohio Light & Power Company and the Northern Ohio Traction & Light Company, have inaugurated a trolley freight line from Pittsburgh to Cleveland and intermediate points. The roads will compete with railroad freight service.

Mayor Wants "City" Parking Fairly Tried.—Protests from retail merchants over parallel parking in the downtown district of Oklahoma City, Okla., have not swerved Mayor Cargill in his determination to ascertain its effect on the traffic problem. Observation and investigation by representatives of the Oklahoma Railway reveal the fact that in practically no city of importance in the country is the 45-deg. angle parking permitted on streets where electric railways operate. The receivers of the company urged the city officials to try out the parallel parking plan, and an experiment for two weeks reveals that while under the old plan there were from two to five accidents daily due to automobiles backing out from the curb in front of street cars, there has been a complete absence of such accidents with the parallel parking.

Insurance on Employees.—The Cleveland Railway, Cleveland, Ohio, has placed group insurance on approximately 5,000 employees with the Travelers' Insurance Company. Those in service from six months to one year are insured for $750, from one to two years, $1,000, increasing $100 each year until a maximum of $2,000 is reached, after eleven years of service. The company bears the entire expense.

Railway Expansion in Tulsa Under Way.—Expansion of lines of the Oklahoma Union Railway in several directions from Tulsa is reported. Construction eastward is progressing at a good rate, with promise of continuous work until the Tulsa fair grounds and Mohawk Park are linked up with the city. At present the only difficulty in sight is a lack of right-of-way for a section of the route to Dawson. The next destination is Mohawk Park, which will be approached from the eastern side. The company has already agreed to establish bus service in that direction. The rail line will afford another connection with the Santa Fé road and take in a new freight territory. Beyond Mohawk the plans are not announced.

Financial and Corporate

$54,965 Balance at Indianapolis

Revenue from Increase in Fare Disappointing—Company Eighteen Months in Arrears in Dividend Payments

The Indianapolis Street Railway, Indianapolis, Ind., reports a balance of $54,965 for the year ended Dec. 31, 1924, after the payment of all expenses, bond interest, sinking fund and $300,000 in dividends. This fact and others were made public following the annual meeting of the company on June 10. Included in the passenger receipts for 1924 is $122,910 derived from increased fares beginning May 21, 1924, all of which sum was expended for special maintenance and the improvement of the service, in accordance with the order of the Public Service Commission. There is also included in passenger receipts $24,971 from Broad Ripple service begun Sept. 1, 1924, and $1,103 bus service north of 34th Street started Dec. 4, 1924. While there was a total increase of $202,341 in revenue passenger receipts during the year 1924, there was a decrease of $133,761 in transfer receipts due to the charge for transfers being reduced from 2 cents to 1 cent beginning May 21, 1924, and a decrease of $7,534 in miscellaneous earnings, making the total increase in gross receipts $61,045.

The revenue derived from increased fares, effective May 21, 1924, namely, 7 cents cash and four tickets for 25 cents, with an extra charge of 1 cent for each transfer, as compared with the previous fare of 5 cents and 2 cents for each transfer, has been much less than anticipated. It was estimated that the increased fares would produce about $500,000 a year additional revenue, all of which would be set aside in a special fund and expended for the improvement of the service. From May 21 to Dec. 31, 1924, the revenue from increased fares over 1923 was $122,910, or an average of about $16,800 a month. From Jan. 1 to April 30, 1925, as compared with the same period for 1923, there is no increase, but as compared with 1924 there is an increase of $26,259.

In its order of April 18, 1924, the Public Service Commission of Indiana made the granting of increased fares contingent upon the company extending its city service to Broad Ripple on or before Sept. 1, 1924. Complying with this order the Indianapolis Street Railway on Aug. 14, 1924, leased from the Union Traction Company of Indiana that part of its line connecting with the tracks of the Indianapolis Street Railway at 46th Street on College Avenue and extending north on College Avenue to 63d Street, thence Eastward to Broad Ripple Park and into said park and began the operation of city cars to and from Broad Ripple on Aug. 31, 1924. Under this arrangement frequent city service is afforded residents of Broad Ripple at regular city fares, namely, 7 cents cash, or four tickets for 25 cents with a transfer for 1 cent to any of the city cars, as compared with a former cash fare of 10 cents and ten tickets for 75 cents without transfers.

EARNINGS OF INDIANAPOLIS STREET RAILWAY

Earnings	1924	1923
Passenger receipts:		
City lines	$4,804,890	$4,602,549
Transfer receipts:		
City lines	246,110	379,871
Miscellaneous earnings:		
Track rentals, etc.	537,175	544,710
Gross earnings	$5,588,176	$5,527,131
Maintenance of way and structures	631,201	643,950
Maintenance of equipment	516,272	516,798
Special maintenance expended from revenue from increased fares by order of Public Service Commission	122,910	......
Total maintenance	$1,270,384	$1,160,748
Operation of power plant	771,997	850,844
Operation of cars	1,616,028	1,594,879
General expenses	425,338	427,887
Total operating expenses	$4,083,749	$4,034,360
Net earnings	1,504,427	1,492,771
Less taxes	384,354	419,868
Net earnings, less taxes	$1,120,072	$1,072,903

The company is still eighteen months in arrears in the payment of dividends on its preferred stock. It paid four quarterly back dividends during the year 1924.

DISPOSITION OF NET EARNINGS OF $1,120,072 IN 1924

Deductions—Bond Interest:	
Interest on $4,000,000 Citizens Street Railroad's 5's	$200,000
Interest on $4,774,000 Indianapolis St. Railway 4's	193,947
Interest on $3,699,000 Indianapolis Trac. & Term. Company's 5's	185,072
Interest on $200,000 Broad Ripple Traction Company's 5's	10,000
Interest on trust equipment notes	3,565
Interest on Indianapolis Car Equipment Company, preferred stock	6,650
Interest on notes, etc.	35,871
Total deductions	$635,107
Surplus (exclusive of accrued depreciation)	$484,965
Deduction from Surplus:	
Indianapolis Street Railway Company sinking fund	$70,000
Indianapolis Traction & Terminal Company sinking fund	60,000
Dividends due on $5,000,000 preferred stock	300,000
Total deduction	$430,000
Balance	$54,965

In presenting the report the directors said in regard to bus competition:

> Independent bus competition, referred to in the last annual report of the company, continues and some new lines have been added.
>
> The necessity of placing this unregulated type of transportation under proper restrictions was duly recognized and an act was passed at the last session of the Legislature placing buses under the control of the Public Service Commission.
>
> The growth and development of any city depends largely upon a reliable street railway system, which, in order properly to function, must have the undivided patronage and support of the local public.
>
> Whenever it is necessary to supplement the present railway service by the addition of buses, this should be done under the direction and control of the Indianapolis Street Railway. Only by such unified and co-ordinated operation can the best service to the public be rendered.
>
> When this patronage is divided both the city and the company are bound to suffer.
>
> On May 6, 1925, the Indianapolis Street Railway filed with the Public Service Commission a petition for a certificate of convenience and necessity to operate buses over certain streets of the city and such other streets as might be found necessary to provide for adequate city transportation. This matter is now pending.

Option Taken on Ottumwa Properties

A deal is pending for the purchase of the utilities at Ottumwa, Ia. Byllesby & Company, Chicago, have given an option until Sept. 1 to Bechtel & Company, Davenport, Ia., to purchase the Ottumwa Traction Company, operating 12 miles of line, and the other Ottumwa utilities included in the local division of the Northern States Power Company. George M. Bechtel of the firm which contemplates making the purchase is president of the Iowa Southern Utilities Company. The investment firm of which he is the head is said to be the largest of its kind in the state.

Foreclosure Proceeding Against Kansas Interurban

The First Trust & Savings Company, Chicago, trustee for the holders of the first mortgage bonds of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., has brought foreclosure proceedings to have the road sold because of the failure to pay obligations due Aug. 1, 1924. Action on these proceedings was held in abeyance pending the outcome of the suit for restitution instituted by Receiver Jobes of the railway against J. J. Heim, majority stockholder. This issue has now been settled. It involved a transaction carried out shortly before the receivership. Mr. Heim contended that in good faith and for a valuable consideration he turned over to the company $212,500, par value, in second mortgage bonds, $47,500 in second mortgage coupons and an option for the purchase of one-half interest in the Kansas-Missouri Terminal Company. The option, however, never was exercised by the interurban line. In return he received $224,000 of first mortgage bonds. Mr. Jobes said the transaction would have the effect of making Mr. Heim a preferred creditor, a standing to which he was not entitled. The court has ordered Mr. Heim to return the $224,000 in first mortgage bonds and $6,720 interest on the bonds.

City Begins Its Side in Baltimore Valuation

The United Railways & Electric Company, Baltimore, Md., concluded its testimony during the week ended June 20 in a hearing being held by the Maryland Public Service Commission to fix the valuation of the company's property. Clarence W. Miles, people's counsel, started to call his witnesses immediately. The case is still under way. A recess was taken until June 22.

Following the signing of a petition on the part of the commission the United presented testimony in connection with the issuance of a weekly ticket for $1. Mr. Miles brought this subject into the valuation hearing when he requested the commission to order the United to show cause why it should not put this system into operation. Charles D. Emmons, president of the United, pointed out that if 10 per cent of the riders should use the pass at $1 the revenues for the year would be reduced $500,000. Walter Jackson, Mount Vernon, N. Y., also testified. He pointed out the limitations of the system. Mr. Jackson appeared as a witness for the company.

People's Counsel Miles opened his side of the valuation hearing by declaring that a fair valuation of the United's properties is not more than $55,000,000. This is about $30,000,000 below the minimum figure given by President Emmons during a previous session. The first witness was Harry E. Gilbert, a real estate broker and tax assessor, who dealt with valuation figures on various items. He was subjected to rigid cross-examination by Edwin G. Baetjer and William H. Maltbie, representing the United. Mr. Gilbert placed the reproduction value of the company's buildings at $5,146,618 and from this amount deducted $1,429,728 for depreciation.

Pittsburgh Utilities in New Deal

The Standard Power & Light Corporation of Delaware has been organized by H. M. Byllesby & Company to acquire control of the Pittsburgh Utilities Corporation. It will have authorized capital of 500,000 shares of preferred, 800,000 shares of Class A common and 30,000 shares of Class B common, all of no par value. It is proposed to issue shortly 100,000 shares of preferred, 410,000 shares Class A and 30,000 shares Class B common. The Pittsburgh Utilities Corporation controls the utilities supplying electric power and light, gas, street railway and other services in Pittsburgh, Pa., and adjacent territory.

Ladenburg, Thalmann & Company, New York, and H. M. Byllesby & Company will jointly control Standard Power & Light Corporation. The United Railways Investment Company, which owns nearly all of the remaining voting shares of Pittsburgh Utilities Corporation, will be jointly controlled by Ladenburg, Thalmann & Company and H. M. Byllesby & Company. The latter have acted in this matter also for Standard Gas & Electric Company, which will have a substantial investment in both situations.

New Company to Hold Virginia Properties

Stone & Webster, Boston, Mass., and their associates have organized the Engineers Public Service Company, under the laws of Delaware, to acquire public utility properties directly or through subsidiaries. Through its initial purchase it will acquire more than two-thirds of the common stock of Virginia Railway & Power Company and will have voting rights in respect to a majority of the preferred stock of that company under arrangements whereby it may purchase such preferred stock prior to July 1, 1926, if it so elects. The company will acquire at an aggregate price of about $2,500,000, directly or through a subsidiary, the entire capital stock of Spottsylvania Power Company, a majority interest in coal properties now supplying a substantial portion of the requirements of Virginia Railway & Power Company and valuable water power rights and other properties in this territory. The policy of the company will be to acquire additional public utility properties when obtainable on advantageous terms. Several other properties are under consideration for purchase. Securities of the new company were offered for subscription on June 25.

Approval of South Shore Deal Asked

Preliminary plans for acquiring control of the Chicago, Lake Shore & South Bend Railway, better known as the South Shore Line, by the Midland Utilities Company, of which Samuel Insull is president, were taken in Chicago on June 24. A petition was filed with the Illinois Commerce Commission by the Chicago, South Shore & South Bend Railroad, a newly organized corporation, asking for authority to buy the property of the South Shore Line at the public sale to be held at Gary, Ind., on June 29. Authority was asked also for the issuance of securities to finance the purchase.

A petition seeking similar authority has also been presented to the Indiana Public Service Commission. As the railroad operates in both states, authority must be obtained from both commissions.

The Illinois Commission was asked to authorize the newly organized company to bid not to exceed $6,474,843 for the property. This is the amount of principal and interest due upon the bonds. The commission was asked to authorize the new company to issue the following securities:

Thirty-year 6½ per cent first and refunding mortgage gold bonds with a par value of $2,000,000.

Fifty-year 6 per cent second mortgage gold bonds with a par value of $250,000.

Fifty-year adjustment mortgage gold bonds, with a par value of $1,750,000, bearing no interest during the first two years, 2 per cent during the third year, 4 per cent during the fouth year, and 6 per cent annually thereafter.

150,000 shares of common stock without par value.

The Midland Utilities Company and the present bondholders will be jointly interested in the property after the reorganization. The Midland Company, however, will have a controlling interest and the operation of the lines will be under the management of Mr. Insull and his associates.

The present value of the physical property of the railroad is given in the petition as $5,836,943, exclusive of real estate used by the railroad in Cook County, Illinois.

The railroad has been in receivership since Feb. 28, pending the working out of a reorganization plan by the first lien holders' committee of Cleveland.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares*† 1913 = 4.84	June 1925 **7 27**	May 1925 **7.27**	June 1924 **6.97**	May 1925 **7.27**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	June 1925 **152.4**	May 1925 **153.9**	June 1924 **157.6**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	May 1925 **222.4**	May 1925 **222.2**	June 1924 **220.0**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	May 31 1925 **4.05**	Apr. 30 1925 **4.45**	May 31 1924 **3.63**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	May 1925 **17.10**	Apr. 1925 **17.72**	May 1924 **15.93**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures	May 1925	Apr. 1925	May 1924	Jan. 1924	Sept. 1924
Number	**1571**	**1658**	**1739**	**2231**	**1277**
Liabilities (Millions)	**38.77**	**50.92**	**69.40**	**122.95**	**27.71**

Conspectus of Indexes for June 1925

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer

Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Eng. News-Record Construction costs 1913 = 100	June 1925 **204.6**	May 1925 **207.2**	June 1924 **216.8**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	May 1925 **155.2**	Apr. 1925 **156.2**	May 1924 **146.9**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	June 1 1925 **13 62**	May 1 1925 **13.32**	June 1 1924 **12 29**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	June 1 1925 **195.2**	May 1 1925 **193.3**	June 1 1924 **183.8**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	May 1925 **151.6**	Apr. 1925 **150.8**	May 1924 **141**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	May 1925 **165.3**	Apr. 1925 **164.8**	May 1924 **161 4**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

Warren & Jamestown Property Passes to New Hands

As a result of a business transaction between the Niagara, Lockport & Ontario Power Company and the Penn Public Service System, control of the Warren & Jamestown Street Railway and the Carrol Electric Light & Power Company passes from the hands of the Penn Public Service Corporation, which property took it over last year, to the Niagara, Lockport & Ontario Power Company. It was decided at the meeting to conduct the business of the Warren & Jamestown Street Railway, a 23-mile interurban between Jamestown, N. Y., and Warren, Pa., as a separate corporation, the stock of which is owned by the Niagara, Lockport & Ontario Power Company. The following officers were elected: H. B. Zimmerman, Jamestown, president; R. S. Hardy, Buffalo, vice-president; H. C. Mather, Buffalo, treasurer; C. E. Sundholm, Jamestown, assistant treasurer and auditor; Warren Tubbs, Buffalo, secretary, and J. F. Kirk, Buffalo, comptroller. Mr. Zimmerman said that the business of the Warren & Jamestown Street Railway would be conducted with the same service and the same personnel, as far as was possible.

Sale of Long Island Electric Railway Ordered

The Long Island Electric Railway, Long Island City, N. Y., operating between Jamaica and Brooklyn, Jamaica and the Belmont racetrack and also from Jamaica to Far Rockaway, has been ordered sold by the Queens Supreme Court before Justice Faber. This action is the result of the foreclosing of a $600,000 mortgage under which the Chase National Bank, the successor to the Hamilton Trust Company, is trustee for the bondholders. Gen. Lincoln C. Andrews was appointed receiver a year ago. The sale is complete and includes all rolling stock, tracks, Cedar Manor carhouse, terminal at Far Rockaway, with all rails, franchises and rights-of-way. State Senator John Karle of Evergreen was appointed referee in the case.

Statistics of Ohio Roads Made Public

Improvements and extensions of service of city railways in Ohio necessitated an increased investment of more than $3,500,000 last year. This is disclosed in a compilation of reports just filed with the Ohio Public Utilities Commission. The exact increase in the total investment of these companies was $3,571,634, bringing the total up to $123,573,233. At the same time taxes and operating expenses increased, the reports show. The total operating expenses were $31,171,325. This is $101,458 higher than the year before. Taxes were boosted by $825,875, bringing the total tax payments to $4,178,230.

Only eight of the seventeen city street railways paid dividends. Last year these lines carried 726,508,833 passengers. Taking the 1920 census as a basis, the number of passenger rides on these lines would be equal to 126 rides for every man, woman and child in the state.

An increase in freight revenue of almost $500,000 is one of the outstanding features of the combined annual reports of interurban railways in Ohio. This reveals that city shippers and farmers are gradually turning to the electric interurban for quick freight service. An increase in the total investment of these companies for the year was $21,703,230, the new money being needed for freight equipment, buses and extension of electric light and power lines operated by the electric railways.

The total investment of the interurbans at the first of the year was $234,337,969. Taxes paid were $2,432,277, or $46,774 each week. There were 60 interurban railways in the State, operating a total of 2,708 miles of track.

Holmesburg Line Sold.—The receivers of the Frankford, Holmesburg & Tacony Street Railway, Philadelphia, Pa., sold on June 19, for $350,000, its equipment, tracks, franchise and real estate. The bid of John Gilpin, who acted for the bondholders' protective committee, was accepted. It was the minimum offer under order of sale issued by the Court of Common Pleas. The sale was a matter of form to clear away the receivership, it was stated, in advance of the city-P. R. T. agreement as to purchase and operation of the line as part of the Philadelphia Rapid Transit system, in which the city is a partner.

Property Formally Transferred.—Property at Third and State Streets purchased several years ago by the Buffalo & Lake Erie Traction Company in the name of A. F. Tideswell, treasurer of the company, was recently formally transferred to the Erie Railways, Erie, Pa., successor to the old Buffalo & Lake Erie Traction Company. The property was included in the purchase of the traction company property last year but the transfer had not been formally made.

Partial Abandonment Allowed.—The Public Service Commission has approved the abandonment by the New York & Stamford Railway of that part of its lines in Rye located on Purdy Street and that portion of the Boston Post Road from Purdy Street to Peck Avenue and in Peck Avenue. There was no opposition to the proposed abandonment.

Seeks to Abandon Line.—The Chautauqua Traction Company has petitioned the Public Service Commission for permission to abandon that part of its line between Mayville, N. Y., and Westfield, about 9 miles, and to connect its line with the Jamestown, Westfield & Northwestern Railroad at the Pennsylvania Railroad station in Mayville. Both the Chautauqua Traction and the Jamestown, Westfield & Northwestern lines are controlled by the same management.

Sale of Properties Proposed.—In a petition filed with the Public Service Commission at Salem, Ore., on June 17, H. D. Wagnon, Portland, proposed the purchase of the railway properties of the Portland Electric Power Company by the city of Portland. He urged the reduction of fares from 8 to 5 cents, extension of transfer privileges and liquidation of the annual deficit by the taxpayers of the municipality. The petition further urged that patrons of the railway be allowed to intervene in the action brought by the housewives' council of Portland to obtain lower fares on the lines of the defendant corporation. The petition of the housewives' council will probably be heard by the commission by July 1.

Tractions Display Strength on Indianapolis Exchange.—A display of strength of various interurban and street railway securities in Indiana has been noticed lately on the floor of the Indianapolis Stock Exchange. There have been trades in several traction issues, dormant for weeks, bid prices being marked higher than for some months. The rise in quoted prices of traction securities seems to be general.

Declaration on Account of Back Dividends.—The Washington Railway & Electric Company, Washington, D. C., has declared a dividend of $20 on the common, on which payments were passed from March 1, 1919, to June 1, 1923. Out of $6,000,000 impounded by the Utilities Commission pending determination of rates of which $500,000 was set aside for paying federal and district taxes, the railroad received $2,944,222, of which the total amount declared for dividends on the common stock of the company for the years in which dividends were passed amounted to $1,300,000. The dividend is payable on July 1.

Increase in Net Income. — For the eleven-month period ended May 31, 1925, the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., had total operating revenue of $39,550,536, against $36,498,974 for a similar period ended in 1924. Total operating expenses advanced from $24,239,102 to $25,930,098 for the period ended May 31, 1925. After the consideration of income deductions net income this year was $4,643,080, against $3,518,522 for the eleven-month period ended May 31 of last year.

New Directors at Jamestown.—William A. Broadhead, Frank E. Gifford, Fletcher Goodwill, Homer M. Preston, William R. Reynolds, William A. Bradshaw, George E. Maltby, George L. Maltby and Robert H. Jackson comprise the new board of directors of the Jamestown Street Railway, the Chautauqua Traction Company, Jamestown, Westfield & Northwestern and the Jamestown Motor Bus Transportation Company. Members of the board never previously associated with the Broadhead traction interests in Chautauqua County are Messrs. Goodwill, Preston, Bradshaw and Jackson.

Two-Mile Road to Be Sold.—Complications growing out of the failure of the Huntingdon Bank led to a court order on June 25 for the sale of the property of the Huntingdon, Lewistown Juniata Valley Traction Company at Huntingdon, Pa., on July 27. Default by the company in the payment of semi-annual interest due on a mortgage held by the bank's assignee resulted in the court order. Huntingdon has a population of 8,000. The road consists of 1.75 miles of track. There are six cars.

Personal Items

W. F. Kelly in New Office

Well-Known Engineer Becomes Chairman of the Board of the Chester Valley Lines

William F. Kelly, formerly vice-president of the company, was elected chairman of the board at a recent meeting of the stockholders of the West Chester Street Railway, West Chester, Pa. This company, together with its bus subsidiary, the Peoples Transportation Corporation, the combination being popularly known as the Chester Valley Lines, controls a transportation system serving more than 1,000 square miles in Chester, Delaware and Montgomery Counties in Pennsylvania and the northern portion of Delaware.

W. F. Kelly

Mr. Kelly was graduated from the University of Pennsylvania in 1892 and received a post-graduate degree the following year. He has been engaged in engineering work since then, mostly for railway, electric power and other public utility properties. As assistant engineer with the Union Traction Company in Philadelphia and later as assistant to the chief engineer of the Metropolitan Street Railway System in New York City, his experience has covered a wide field in design and construction of practically all departments of electric railway service.

For fourteen years he was associated with the engineering firm of Ford, Bacon & Davis, New York. He had charge of the construction of much of their important work in Birmingham, Ala., and Memphis, Tenn., Youngstown, Ohio, and other towns in the Eastern, Southern and Middle States. He also was engaged in special investigations, valuations and reports on many of the large utility systems of the country.

Since 1915 he has been a member of the engineering and management firm of Kelly, Cooke & Company, Philadelphia. Most of this firm's activities have been devoted to public utility properties. For it Mr. Kelly has examined and reported on a great number of situations in the United States and been called to appear before utility commissions on matters of valuation, service and rates. In recent years the firm has been doing some notable work in connection with rejuvenation of electric railway properties and the improvement of their public relations.

The development of the Chester Valley Lines, which is controlled and managed by Kelly, Cooke & Company, was described in the ELECTRIC RAILWAY JOURNAL for Nov. 22, 1924.

Appointments at Detroit Announced

Rufus G. Lathrop, a Detroit attorney, has been appointed secretary to the Street Railway Commission at Dethe Street Railway Commission at Detroit, Mich. Mr. Lathrop was appointed by the commission upon the recommendation of former Judge James O. Murfin and John C. Lodge, president of the City Council. He succeeds I. N. Merritt.

W. M. Hauser of the Detroit Rapid Transit Commission has been appointed auditor for the street railway department, assuming part of the duties of Mr. Merritt, who was auditor as well as secretary to the commission.

There has been no new appointment to fill the position at the head of the claims department vacated by the resignation of Clarence E. Wilcox. Immediately following the dismissal by the commission of Mr. Schram and Mr. Merritt, the commission received the resignation of Mr. Wilcox, head of the legal division, and H. B. Shelden, chief claims agent. Mr. Wilcox addressed his letter to Mayor Smith, the Street Railway Commission and H. U. Wallace, general manager, asking that his resignation be accepted to take effect immediately.

The duties of the head of the claims department are now being carried out by the Corporation Counsel's office, which is headed by Charles P. O'Neil. A. L. Barkey of the city staff has been placed in immediate charge.

Mr. Wilcox, the former head of the claims department, was appointed to that position early in 1924 by acting Mayor Joseph A. Martin. His appointment was contested by Corporation Counsel Richard I. Lawson, as illegal. Mr. Lawson was later dismissed by Martin, and George A. Kelley, who was appointed to succeed him, approved the appointment of Mr. Wilcox.

General Andrews Receives Degree

At the commencement exercises of Trinity College, Gen. Lincoln C. Andrews, Assistant Secretary of the Treasury, receiver of the New York & Queens County Railway, Long Island City, and one of the best-known men in public life in Queens, received the honorary degree of doctor of laws.

Promotions on North Shore

Messrs. Thompson and Fallon Vice-Presidents—J. S. Hyatt in New Office of General Manager

Charles E. Thompson and Bernard J. Fallon were elected vice-presidents and Jesse S. Hyatt was appointed to the new office of general manager and also made chief engineer at a recent meeting of the board of directors of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

The promotion of Mr. Thompson came shortly after the close of his twentieth year of service with electric railways, seventeen of which were spent with the North Shore Line. His first job with the company was chief clerk to the auditor, which also carried with it the duties of paymaster. At that time the line was operated between Evanston and Waukegan.

C. E. Thompson

In 1907 Mr. Thompson was made auditor, but later he served as purchasing agent. In 1915 and 1916 he was general manager. When the line came under the management of Samuel Insull and associates Mr. Thompson was made assistant to the president. This position he held until the time of his most recent promotion.

Mr. Fallon's service began with the North Shore Line when it came under its present management, he having served previously with the Chicago Rapid Transit Company. His service with the latter company approximates twenty years. He was engineer maintenance-of-way, general manager and for the past year vice-president in charge of operation. He held the position of chief engineer with the North Shore Line at the time of his election as vice-president.

Mr. Hyatt began work with the North Shore Line in 1903 as a rodman during the period of construction of the railroad. Later he was employed by the Grand Trunk Pacific Railroad, but returned to the North Shore Line in 1905. With the exception of two years from 1910 to 1912, when he was employed as secretary and treasurer of the Lake County Telephone Company, he has since served with the North Shore Line. He was engineer maintenance-of-way at the time of the recent election.

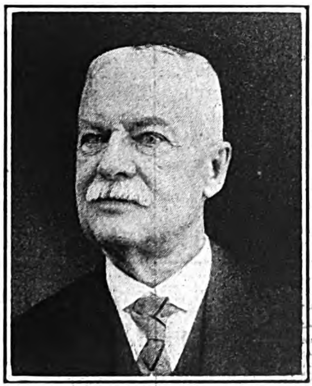
Lincoln C. Torrey, formerly assistant

treasurer, was made assistant secretary in addition at the directors' meeting. Mr. Torrey came to the North Shore Line in 1921 from the Goodyear Tire & Rubber Company in Akron, Ohio. He has served the company as engineer, auditor and valuation engineer in addition to the above duties.

New Personnel in Charge of Broadhead Interests in Jamestown

Homer M. Preston has been elected president of the Jamestown Street Railway, the Chautauqua Traction Company, the Jamestown, Westfield & Northwestern Railway and the Jamestown Motor Bus Transportation Company, all of Jamestown, to succeed the late Almet N. Broadhead, who controlled all of these companies. While separate corporations will be continued, the traction and bus lines will be operated under one general management, and the officers and directors of the companies will be identical.

Mr. Preston formerly was a director and vice-president of the Warren-Jamestown Street Railway, in which capacity he served many years. He also has been associated with the Southwestern Interurban Company, operating in Kansas, and also of the Union Traction Company, Coffeyville, Kan.



G. E. Maltby

George E. Maltby, who has been general manager of the Broadhead traction lines for 40 years, has been promoted to the position of vice-president, with general supervision over all the Broadhead traction system. His connection with the Jamestown Street Railway dates back to the days of horse cars.

George L. Maltby, a son of George E. Maltby, has been appointed general manager of the various traction lines. Until last September he had been superintendent of the lines for fourteen years, but resigned to enter the automobile business. He now returns to the affiliated companies as general manager.

The executive committee in charge of the operation of the properties includes Messrs. Preston, Broadhead and Robert H. Jackson.

Harold Evans has been appointed to the Pennsylvania Public Service Commission.

Many Changes on New Haven

N. M. Rice New Vice-President—C. L. Bardo on Leave of Absence—Other Appointments Made

N. M. Rice, for the last five years general purchasing agent of the New York, New Haven & Hartford System, has been elected vice-president of the company in charge of purchases and stores. Mr. Rice was formerly vice-president in charge of purchasing and stores on the Atchison, Topeka & Santa Fé Railroad.

J. O. Halliday, superintendent of transportation, has been appointed manager of transportation, reporting to the general manager. He will co-operate directly with the freight traffic manager and the passenger traffic manager. Mr. Halliday has been on the New Haven System for a long period.

C. L. Bardo, general manager, having requested leave of absence, the duties and authority of general manager will devolve upon and be exercised by J. A. Droege, general superintendent of the New York Division. He is appointed acting general manager. Mr. Droege in various capacities and at different times has been in charge of operation of all parts of the New Haven System. Mr. Bardo is particularly well known in electrical engineering circles. He was formerly superintendent of the electric division of the New York Central Railroad at New York.

W. H. Foster, general superintendent Lines West, with office at New Haven, has been appointed general superintendent of the New York Division.

E. E. Regan, superintendent of the New Haven and New London Divisions, has been appointed acting general superintendent Lines West.

W. L. Bean has been made mechanical manager to take the place of L. N. Reed, resigned. Mr. Bean went to the New Haven Railroad in 1916 as assistant to Mr. Pearson in his investigation of the property, and in formulating the report and recommendations in accordance with which the program for the improvement of the property was undertaken. In 1917 Mr. Bean was made assistant general mechanical superintendent, and on Nov. 1, 1918, mechanical assistant to the president. He acted in that capacity until Dec. 1, 1923, at which time he was made assistant mechanical manager.

George A. Moriarty, mechanical superintendent Lines East, has been appointed general mechanical superintendent, with office at New Haven.

The title of H. P. Hass, special assistant to mechanical manager, has been changed to assistant to mechanical manager.

F. E. Ballda, assistant to mechanical manager, has been appointed mechanical superintendent Lines East, with headquarters at Boston, vice G. A. Moriarty, promoted.

Kenneth Cartwright has been appointed assistant mechanical engineer in charge of specifications, design, records and standards of equipment.

J. E. Slater, formerly special assistant to the general manager, has been made assistant to the general manager; E. B. Perry has been appointed assistant to the general manager. Mr. Perry has been supervisor of wage schedules. In their new capacities Mr. Slater will represent the general manager in all budget matters and will have charge of the analysis of operating performances and costs, while Mr. Perry will represent the general manager on matters affecting wages, working conditions, and group insurance. The titles of special assistant to the general manager and supervisor of wage schedules have been abolished.

F. V. Underwood General Manager in Knoxville

Fred V. Underwood, for many years associated with electrical interests in Alabama, has just been appointed general manager of the Knoxville Power & Light Company, Knoxville, Tenn. Up to the present time C. H. Harvey has been president and general manager at Knoxville, while H. U. Wallace, recently appointed general manager of the municipal railway at Detroit, formerly was assistant general manager of that property. Mr. Underwood will have direct charge of railways and the respective heads of the transportation, mechanical, way and structures and line departments will report to him.

F. V. Underwood

Mr. Underwood entered the public utility field in 1900 in the employ of the Consolidated Electric Light Company of Birmingham. This company later became part of the Birmingham Railway, Light & Power Company, now the Birmingham Electric Company. He continued with the Birmingham properties through their reorganizations to the present time. A practical operating man, he has worked his way through various positions with the Birmingham company to be assistant general manager.

During the World War Mr. Underwood was for a short time connected with the Alabama Power Company as superintendent of production, having charge of its generating plants. His principal attention, however, was given to the operation of the Gorgas plant, where construction work was rushed in order to furnish power for nitrate plants at Muscle Shoals.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Increasing Efficiency in Production

Manufacturing industries are making astonishing progress in efficiency, recent calculations show. Production of manufactured goods in 1923 was 65 per cent greater than that of 1914. The increase in personnel was only 25 per cent. While some other factors enter into the comparison, the principal causes responsible are held to be increased efficiency in management, an increase in the skill of workers and the increased use of machinery. The entire increase in personnel was among the wage workers. Apparently it has been found possible to increase output without increasing the staff.

High prices of materials and high wages have stimulated efficiency. When the railroads were paying 75 cents a ton for coal, for instance, they paid little attention to its conservation. Subsequent high prices of the fuel, however, stimulated its more efficient use.

The systematic effort to stimulate efficiency and sensible conservation has been known as the program for the elimination of waste in industry. The term is not regarded as a satisfactory one, as it conveys to the public an implication of willful waste.

Demands for Space Unprecedented

Previous records of requests for space at the October convention have all been broken. To the close of business June 23, 139 companies had applied for 76,689 sq.ft. The similar date last year shows that 91 companies had applied for 47,810 sq.ft. The increase is 48 applicants and 28,879 sq.ft.

The exhibit committee will assign space on July 1. All applications received up to the close of business June 30 will have the committee's attention at this meeting.

Should any space remain after the initial allotment has been made, it will be assigned by the director of exhibits in the order in which applications are received.

Patent Office Situation Is Improving

Greater liberality on the part of Congress in the matter of appropriations has improved the Patent Office situation somewhat, but it is recognized that the trouble is not all due to lack of funds.

Means of improving practice on the administrative side now are being considered. One way would be to relieve the Commissioner of part of his judicial functions. To this the patent lawyers object. They seem to think the present cumbersome appeal machinery is necessary. A question raised by the examiners, under present procedure, can be appealed to a board of examiners, then to the Commissioner, then to the Supreme Court of the District of Columbia, then to the Court of Appeals, and finally to the Supreme Court of the United States. Some think "six jumps to justice" are too many.

Other industrial countries require the commercial production of the article patented within certain time limits. This makes it necessary for American inventors to start manufacturing plants all over the world. On the other hand, Germany and England, for instance, by taking out patents here can prevent manufacture in this country. Equality of treatment to American inventors will be sought at The Hague.

Chicago "L" Rushing Improvement Plans

Word has been received by the Chicago Rapid Transit Company that the first of the 100 additional steel cars, recently ordered, will arrive about July 1. All of these new coaches are expected to be in service by Oct. 1. They are under construction in the shops of the Cincinnati Car Company, and are the same as the modern plush-seated steel cars recently placed in service, except that motors and running equipment have been improved.

Rolling Stock

New York, New Haven & Hartford Railroad, New York, is in the market for 50 buses as equipment for its new motor transportation subsidiary, the New England Transportation Company. All equipment to be ordered at present will be for passenger business, and bids will be asked of several manufacturers.

Coast Cities Railway, Asbury Park, N. J., recently placed in service on its line between Asbury Park and Long Branch, N. J., seven light-weight, double-truck, one-man, two-man cars built by the J. G. Brill Company and referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 10, 1925. The new cars are equipped with automatic safety devices, air-operated sanders, and electric motorman signal system. Trucks are of the Brill lightweight No. 77-EX type, 5 ft. x 4 in. wheelbase and equipped with 26-in. diameter wheels. Quadruple 35-hp. motors are mounted on these trucks. Doors on both sides of each platform are of the double two-part folding type pneumatically operated. The seating capacity is 40. All seats are upholstered in brown imitation leather. Interior woodwork is of cherry stained mahogany. Agasote is used for headlining and also for the inside lining below the window sills.

Track and Line

Hull Electric Company, Hull, Que., contemplates paving about 1,000 ft. with concrete and asphalt on Laurier Avenue and Hotel de Ville Street.

Morris County Traction Company, Morristown, N. J., is to seek permission in the United States District Court at Newark to spend between $135,000 and $140,000 for improvements to its tracks in Dover, Madison and Chatham. It is estimated by the company that 30,000 sq.yd. of paving will be required for the three municipalities. Preliminary arrangements with the State Highway Commission were disposed of recently and the necessary formalities attended to by the company's receivers.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is eliminating two right-angle curves in Milwaukee by means of a diagonal right-of-way through two city blocks from the start of one of the curves to the end of the second. The new route is so short that it will not materially reduce the running time, but it will make for safer operation. It is expected that the new track will be in use early in July.

St. Johns Electric Company, St. Augustine, Fla., is extending its line to the beach, which has been cut off from trolley communication with the city for about three years. The present track is being relaid far enough inland to make it safe, as the old track had been washed out in one of the fall storms.

Trade Notes

Hynes & Cox Electric Corporation, Albany, N. Y., is doing work along industrial heating lines and expects to follow up shop and power house possibilities in the railway field. Lee P. Hynes, the president of the corporation, formerly was consulting engineer for the Consolidated Car Heating Company. Theodore M. Cox is vice-president and treasurer of the Hynes & Cox Electric Corporation.

Economy Electric Devices Company, Chicago, Ill., has received an order to equip the Atlanta property of the Georgia Railway & Power Company with Economy meters having dials for car inspection on the kilowatt basis. This job will total 300 meters.

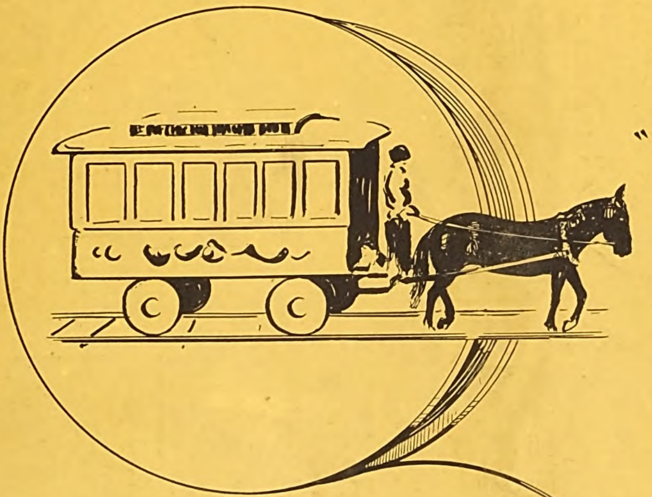
Metal, Coal and Material Prices

Metals—New York	June 23, 1925
Copper, electrolytic, cents per lb	13.625
Copper wire base, cents per lb	15.50
Lead, cents per lb	8.20
Zinc, cents per lb	7.33
Tin, Straits, cents per lb	56.50
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.775
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N.Y., per gal.	$1.05
White lead in oil (100-lb. keg), N. Y., cents per lb.	0.1575
Turpentine (bbl. lots), N.Y., per gal.	$1.03

AP 13 '25

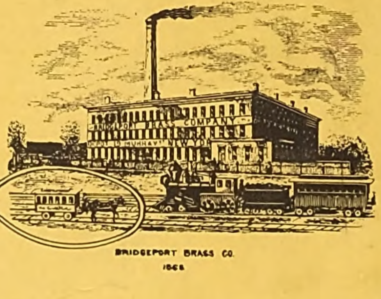
McGraw-Hill Co., Inc.
April 11, 1925
Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL



"When the brake was whoa!"

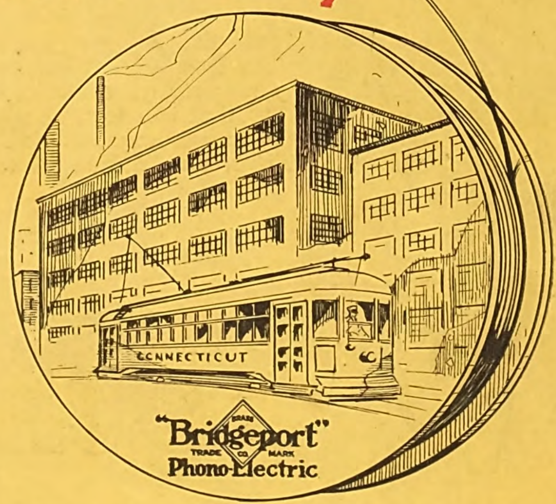
60 years ago—



the Bridgeport Brass Company was founded. The horse-drawn street-car was already a twenty-year old institution. Kerosene lamps were just coming in.

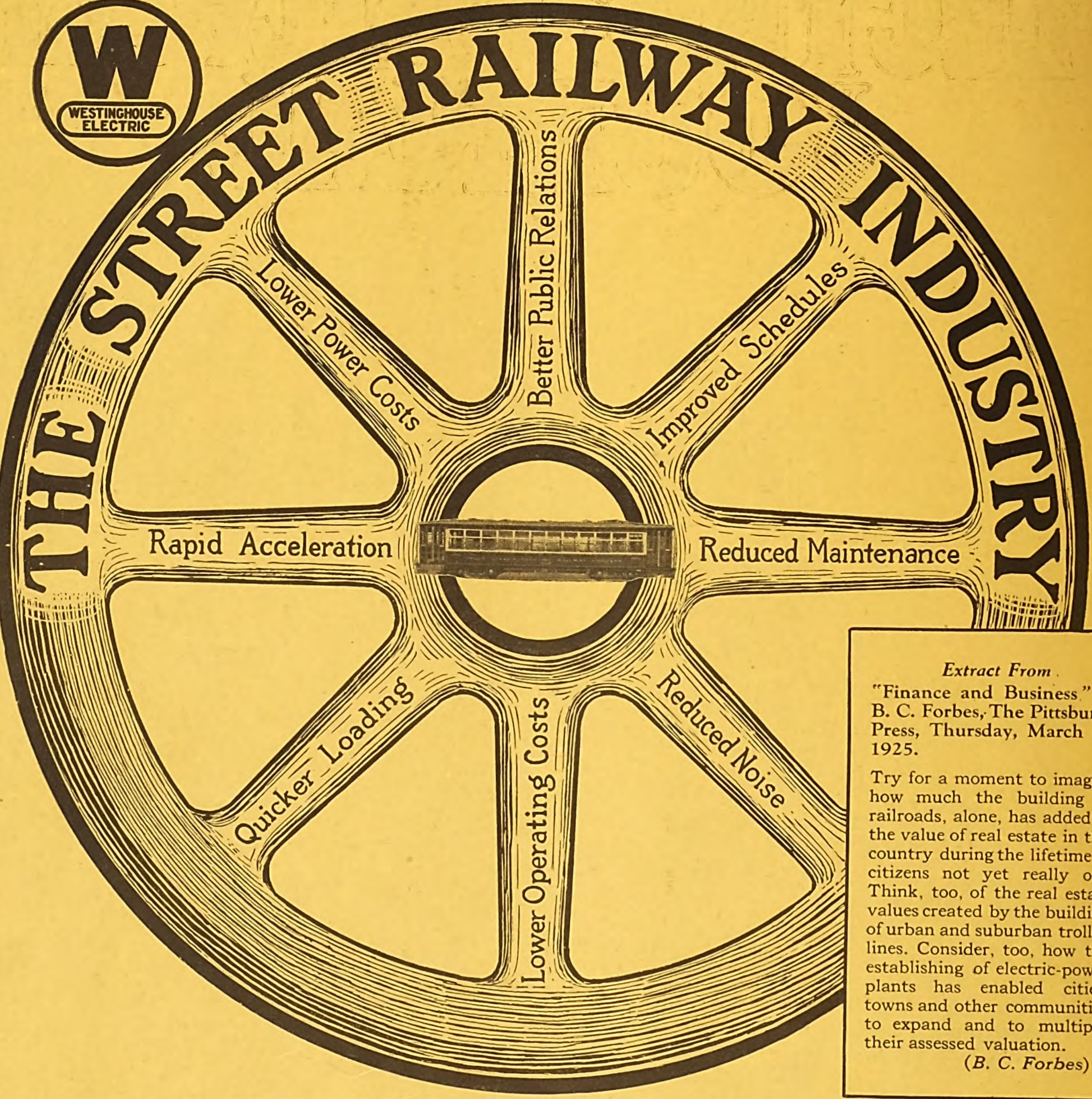
Beside this first plant ran the old horse line shown here, forerunner of the double track, short-headway electric service now maintained here by the Connecticut Company. And on the same site has risen a brass plant of proportions undreamed of probably by its founders. Phono-Electric, one of its products, is best known to electric railway men because of its long-wearing, non-corrodible, ductile qualities. It costs more per mile but less per year.

and Today



Bridgeport Brass Company
BRIDGEPORT - CONNECTICUT
NEW YORK PHILADELPHIA CHICAGO DETROIT
Phono-Electric

WESTINGHOUSE ELECTRIC


THE STREET RAILWAY INDUSTRY
Lower Power Costs
Better Public Relations
Improved Schedules
Rapid Acceleration
Reduced Maintenance
Quicker Loading
Lower Operating Costs
Reduced Noise

Extract From
"Finance and Business," by B. C. Forbes, The Pittsburgh Press, Thursday, March 12, 1925.

Try for a moment to imagine how much the building of railroads, alone, has added to the value of real estate in this country during the lifetime of citizens not yet really old. Think, too, of the real estate values created by the building of urban and suburban trolley lines. Consider, too, how the establishing of electric-power plants has enabled cities, towns and other communities to expand and to multiply their assessed valuation.

(*B. C. Forbes*)

The Modern Light-Weight Car Is The Hub of the Industry

As the problems of congestion become greater and greater, and as the use of automobiles increases, The Street Railway Industry becomes more and more dependent on a type of car that can load and unload quickly, clear crossings in the minimum time, outspeed competitive street vehicles, and attract patronage.

The light-weight, double-truck car combines these features admirably and, in addition, offers real economy.

The continued progress of the industry depends upon this type of car.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Westinghouse

X 80628

AP 20

MAINTENANCE ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc.

April 18, 1925

Twenty Cents Per Copy

You Can't Wear Out

A Twin Tie Foundation

Car wheels wear rail; joints under long sustained and heavy traffic reach an ultimate life, paving carrying vehicle traffic over long periods sustains wear, but you can't wear out a Twin Tie Foundation.

Renewal of rail on heavy traffic streets has proven all this in Cleveland. It has also developed an improved design providing for convenient and quick renewal.

The details in our new catalog with a quotation will be sent on your request.

The INTERNATIONAL
STEEL TIE COMPANY
Cleveland, Ohio

Track extension using Steel Twin Ties in San Diego, Calif.

Steel Twin Tie Track

Renewable Track · · Permanent Foundation

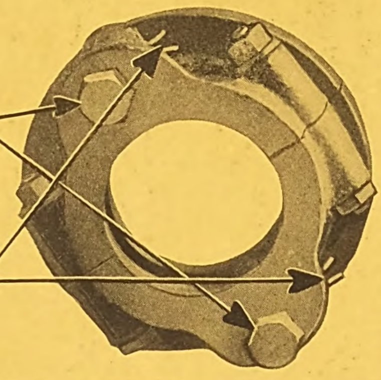
HOW MANY—

of your motors are held in the correct position on the axle?

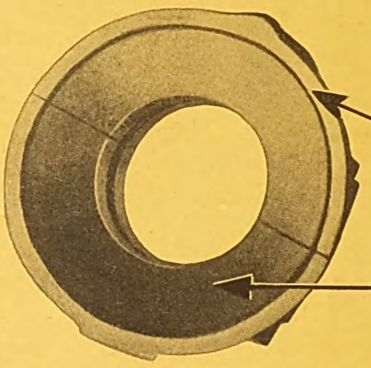
Consider the armature end-play and the lateral movement of the motor on the axle, as commonly experienced, which result in a short life of pinions, bearings, gear cases, etc. Why not give your motors a "sporting chance" with a ***Quality Axle Collar?***

Adjustable Screws Sherardized Permit taking up end-play of motor on axle.

Adjusting Bolts locked by cotter pins to prevent change in position.



Complete Axle Collar, Front View



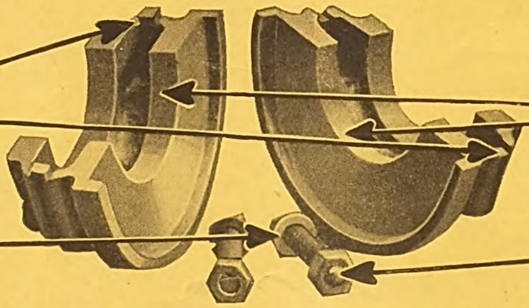
Complete Axle Collar, Rear View

Lip, overhanging axle bearing flange, provides dust-proof protection at the rubbing surfaces.

The material of the collar is semi-steel, strong and durable.

Tongue and Groove are provided at the parting.

Lock Washer



Upper Half of Axle Collar Lower Half of Axle Collar

Careful machining assures a tight clamp action of the collar on the axle seat.

Clamping Screw

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

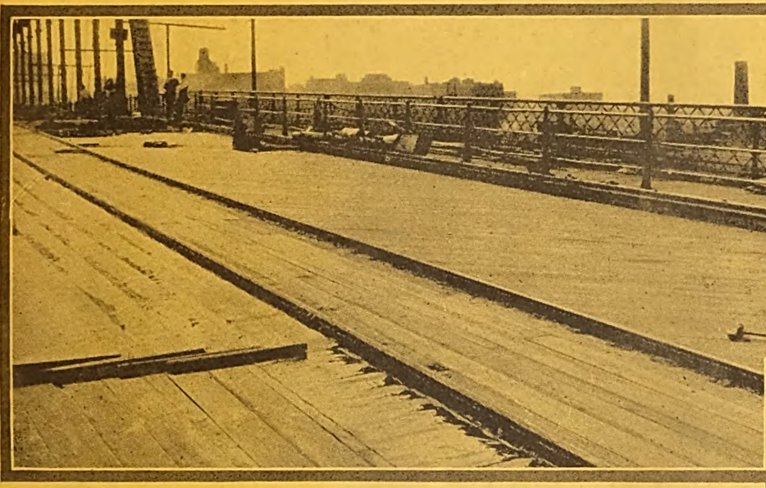
W WESTINGHOUSE ELECTRIC

Westinghouse

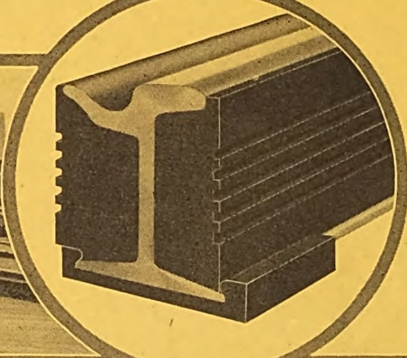
X79747

McGraw-Hill Company, Inc.   April 25, 1925   Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL



Omaha and Council Bluffs Street Railway Bridge, Omaha, Neb



Carey Elastite Rail Filler is made to fit any rail section.

Gilbert Ave., Viaduct, Cincinnati, Ohio

Make the track as water-tight as the bridge-deck!

Engineers take every precaution to waterproof bridges and viaducts, yet there has always been a vulnerable point between the track and the bridge paving through which water and frost might enter, resulting in the weakening of the structure and concrete staining.

But now car-tracks can be made just as water-tight as the bridge-decking. On the Omaha and Council Bluffs street railway bridge over the Missouri at Omaha, Nebraska, and the Gilbert Avenue viaduct at Cincinnati, Ohio, Carey Elastite Rail Filler makes a water-tight and frost-tight seal between the rail and the paving. It protects the bridge, absorbs vibration, dissipates traffic-impact, prevents paving-disintegration, and reduces traffic-noise.

THE PHILIP CAREY COMPANY
53 Wayne Ave., Lockland, Cincinnati, Ohio

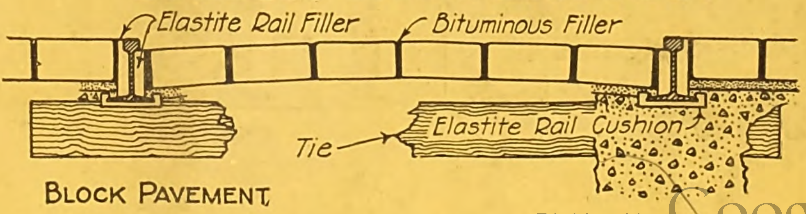
Send for Complete Data

Elastite Rail Filler

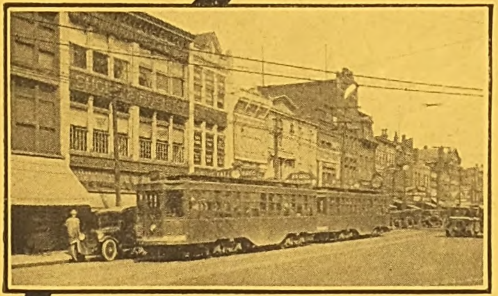
is easy to install. A tap of a mallet sets it in the web of the rail. Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail-vibration, and traffic-noise. It is preformed to fit any rail section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

Carey Elastite

SYSTEM OF TRACK INSULATION



Superior City Transportation Service with Flexible, Multiple-Unit Train Operation



"PITTSBURGH
PROMOTES
PROGRESS"

Pittsburgh Railways Company

is placing in mass-transportation service 160 low-floor, light-weight cars, each equipped with four Westinghouse No. 514-P, 40 horse power motors, and multiple-unit control.

Two-car trains are operated during the rush periods of the day, and at such other times as passenger traffic requires.

The advantages obtained are greater flexibility of equipment, platform and energy savings, smoother and more rapid acceleration, as compared with trailer operation, and a pleased patronage.

Discuss your problems with the Westinghouse representative.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

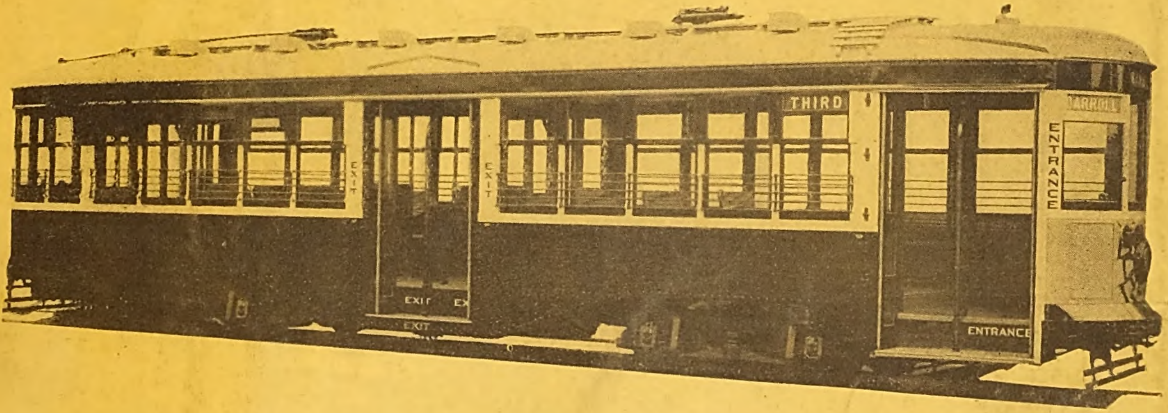
"New cars are replacing old cars on Pittsburgh streets."

Westinghouse

X 80646

McGraw-Hill Co., Inc. May 2, 1925 Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL



Rolled Steel Wheels manufactured by us will be used on new equipment ordered from Brill by Brooklyn City Railroad

STANDARD STEEL
WORKS COMPANY
PHILADELPHIA, PA.

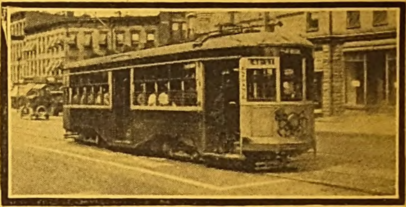
BRANCH OFFICES:

CHICAGO
ST. LOUIS
NEW YORK
HOUSTON, TEXAS
PORTLAND, ORE.
RICHMOND, VA.
SAN FRANCISCO
BOSTON
ST. PAUL, MINN.
PITTSBURGH, PA.
LOS ANGELES, CAL.
MEXICO CITY, MEX.

WORKS: BURNHAM, PA.

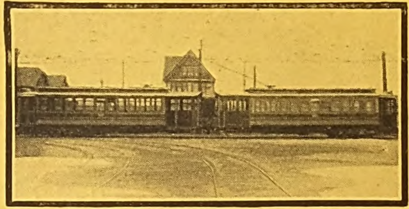
Reliable Transportation Service, with Dependable and Efficient Westinghouse Electrical Equipment, Increases Daily Receipts.

Last year the electric railway industry carried each average day 44,000,000 passengers. This amounts to transporting the entire population of the United States every two and a half days. The total transportation requirement is increasing every day because of America's industrial growth.



Modern City Car

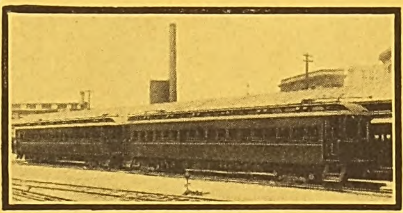
Rush-Hour Train



Articulated Train

Elevated Train

Subway Train



Suburban Train

Safety Car

There is Westinghouse equipment available for every electric railway service. Many old cars in operation over twenty years can be replaced with attractive up-to-date equipment, resulting in better schedule speeds, lower maintenance and increased patronage. Discuss your problems with the Westinghouse representative.

WESTINGHOUSE ELECTRIC

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION

Westinghouse

X80667

McGraw-Hill Co., Inc. May 9, 1925 Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL

ELECTRIC SERVICE SUPPLIES COMPANY
CATALOG No7
CAR EQUIPMENT
CATALOG No9
Electric Service Supplies Co.
Philadelphia Chicago
BUS EQUIPMENT
Bus Equipment
for Buses too—

No. 9

A new ESSCO CATALOG

Supplementing the popular Essco Catalog No. 7 on Car Equipment, this new book is devoted to Keystone Equipment for motor buses. It should be included in your reference library.

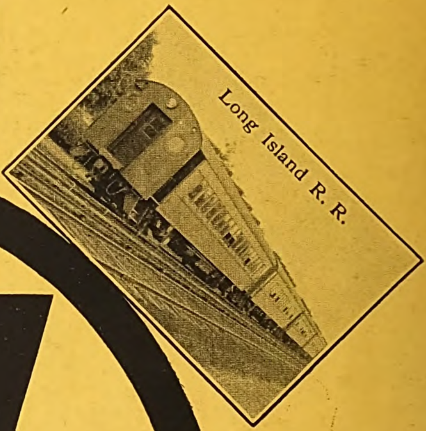
Send for your copy

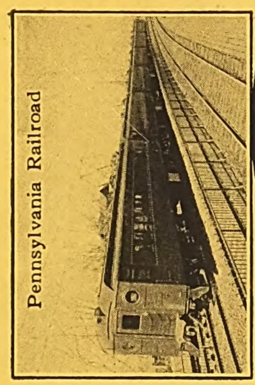
Electric Service Supplies Co.
17th and Cambria Streets,
PHILADELPHIA, PA.
50 Church St., New York Monadnock Bldg., Chicago

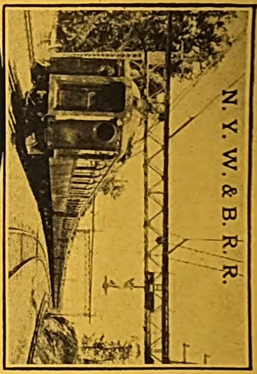
Multiple-Unit Trains For Terminal and Interurban Operation

Pennsylvania Terminal

N. Y., N. H. & H. R. R.


Long Island R. R.


Pennsylvania Railroad


N. Y. W. & B. R. R.

WESTINGHOUSE ELECTRIC

Mutiple-Unit Train Operation has many advantages:

- Flexibility of unit cars.
- Length of train determined by traffic demands.
- Operation from either end makes turning unnecessary.
- Rapid acceleration permits increased schedule speeds, which means increased track capacity.
- Reduction of non-revenue train movements.

Ask the Westinghouse Representative about it.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Westinghouse

X 80656

Y 18'25

MAINTENANCE ISSUE

ELECTRIC RAILWAY JOURNAL

May 16, 1925

1924 Track construction
Derry St., Harrisburg, Pa.

A Steel Tie Track Foundation

IMPROVES WITH AGE

NO PART of a Steel Twin Tie Track foundation deteriorates with age or service. Rail renewal on 12-year old foundations on heavy traffic streets has demonstrated that.

New methods of initial installation provide for easy renewal, eliminate shrinkage of concrete and make tamping simple.

Write NOW for the new catalog and quotation.

International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation

High Grade Protection

Type K-3 Lightning Arresters

For Car, Line and Station Use
100-1500 Volts Direct Current

This arrester should be used where local lightning conditions are such that a higher degree of protection is justified than is afforded by the inexpensive Westinghouse Type MP Arrester.

WESTINGHOUSE
ELECTRIC & MFG. CO.
PITTSBURGH, PA. U.S.A.
LIGHTNING ARRESTER TYPE K-3
D.C. VOLTS. STYLE NO.

WESTINGHOUSE ELECTRIC

Type K-3 is a dry-type arrester and stays on the cars the year round.

It handles only transient energy on the line, and does not allow any power current to pass, thus the Type K-3 Arrester does not cause any surges in the circuit, as do arresters that have to break heavy power arcs after each discharge.

About five arresters per mile are recommended for line protection, and one or two to each car. It can be mounted on top or under the car.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Leaflets 20021 and 20239
give full details.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries.

Westinghouse

X 78733

McGraw-Hill Company, Inc.
May 23, 1925
Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL

MY 25 '25

Installation of Carey Elastite System of Track Insulation on Maryland St., Indianapolis, Indiana, by the Indianapolis Street Railway Company.

Indianapolis Street Railway Company Cushions Its Tracks

IN re-laying its tracks on Pennsylvania and Maryland streets the Indianapolis Street Railway Company installed the Carey Elastite System of track insulation.

The rails were encased in an asphalt cushion that absorbs normal rail movement, lengthening the paving life. The rail filler provides a water-tight seal between the rail and the paving, preventing frost-action.

Past experience with other installations elsewhere indicates that the Indianapolis Street Railway Company will cut down its maintenance costs on this track structure by 30 to 50%, besides providing quieter, smoother operation.

Send for further facts

THE PHILIP CAREY COMPANY
53 Wayne Ave, Lockland, Cincinnati, Ohio

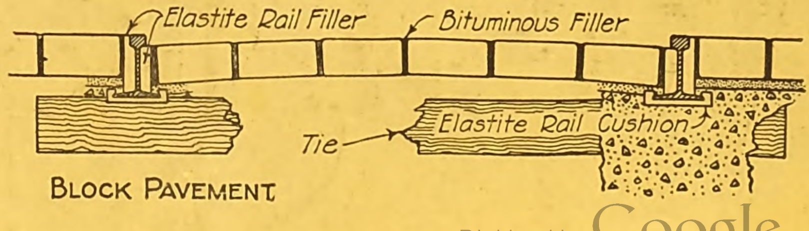
Elastite Rail Filler is Easy to Install

a tap of a mallet holds it in the web of the rail.

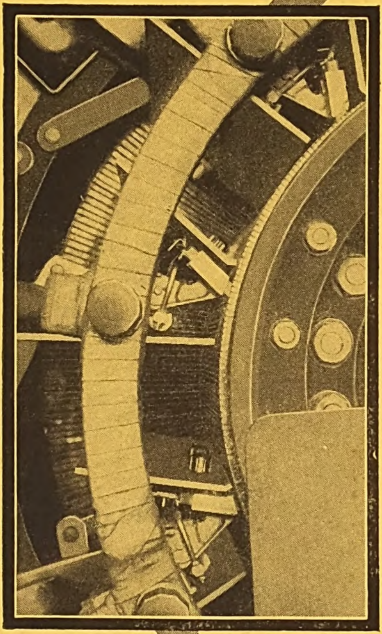
Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail vibration and traffic-noise. It is pre-formed to fit any rail-section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

Carey Elastite

SYSTEM OF TRACK INSULATION



Protection!



THE design and arrangement of the flash barriers on a Westinghouse Railway Converter constitute a masterpiece of simplicity—real protection to equipment.

In case of short circuit, this flashguard assembly reduces to a minimum the possibility of a direct arc between brackets and is so designed that any generated gases quickly escape.

Another feature, most important from a practical operating consideration, is the fact that this flashguard in no way interferes with the maintenance of the d-c. brushes and commutator.

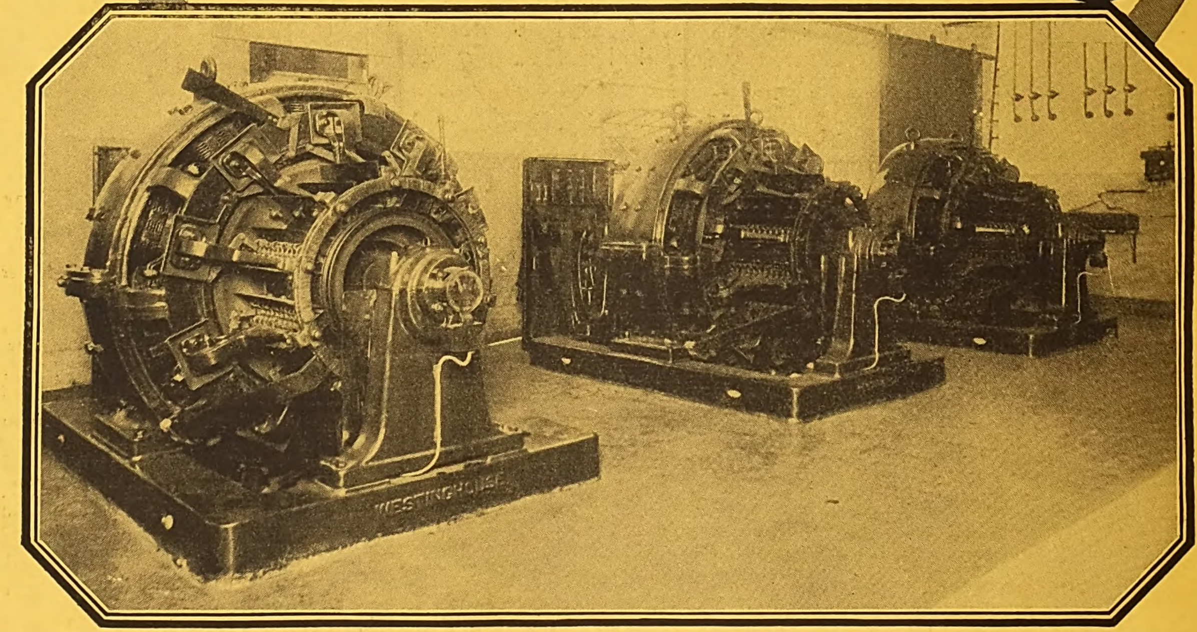
Westinghouse Railway Converters have developed step-by-step with the demands of the industry. They are superior in the things that assure longer life and continuity of service.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Westinghouse Electric & Manufacturing Co.
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

W
WESTINGHOUSE ELECTRIC

Three Westinghouse 60 cycle railway converters, Eastern Massachusetts Street Railway



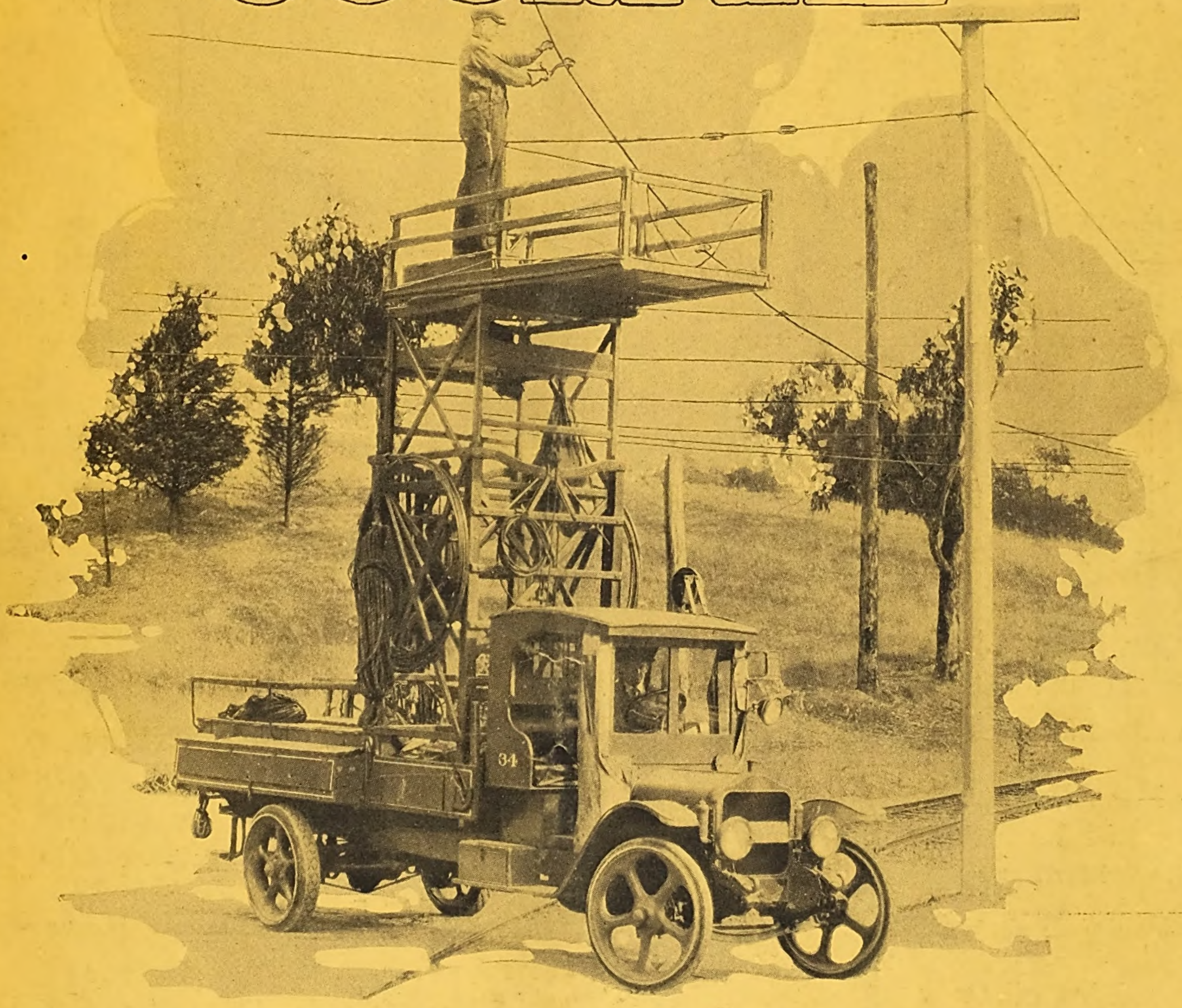
Westinghouse

X 80660

W Jun 1 '25

McGraw-Hill Company, Inc. May 30, 1925 Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL



Dependable performance has built
WHITE TRUCK LEADERSHIP

Year after year The White Company continues to strengthen its position of leadership as a manufacturer of high-grade motor trucks. The stability of the company together with its many years of experience as a truck and bus maker is a guarantee to the purchaser of White Trucks and Busses that his equipment is right and that his investment is protected.

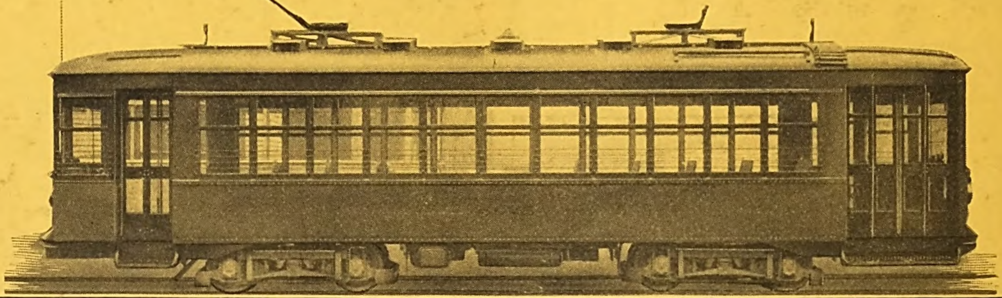
White dependability has led scores of electric railways to standardize on White Trucks. More than 1,000 White Busses are used by electric railways to supplement rail service.

THE WHITE COMPANY
Cleveland

WHITE TRUCKS

The Modern, Light-Weight Electric Street Car
The Hub of The Industry's Service

It is the only solution for City Mass Transportation and Street Congestion Problems



Pleased Passengers

Increased Patronage

Enhanced Earnings and Dividends

Safety Features
Minimizing boarding or alighting accidents

High Efficiency
and Mass Transportation capacity, operating in congested street traffic

Improved Schedules
Mean more car miles per hour

Comfort and Convenience

Rapid Acceleration

Easy Entrance and Exit
Low Floor

Reliable Operation
Less Failures in Service

Flexibility
Single or Multiple car operation

Lower Operating Costs
One or Two-man Operation

Reduced Maintenance
Modern Motors and Control

Reduced Energy Requirements
Light Weight

REPRESENTING the experience of forty years operation by the electric railway industry, joined with the productive effort of America's leading manufacturing organizations, the modern light-weight electric street car stands on a foundation of proved usefulness.

Its application on railway properties is based on known advantages and it holds forth no hidden possibilities of operating deficits.

It both pleases and attracts patronage.

Westinghouse Motors and Control are a necessary part of every modern light-weight car.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

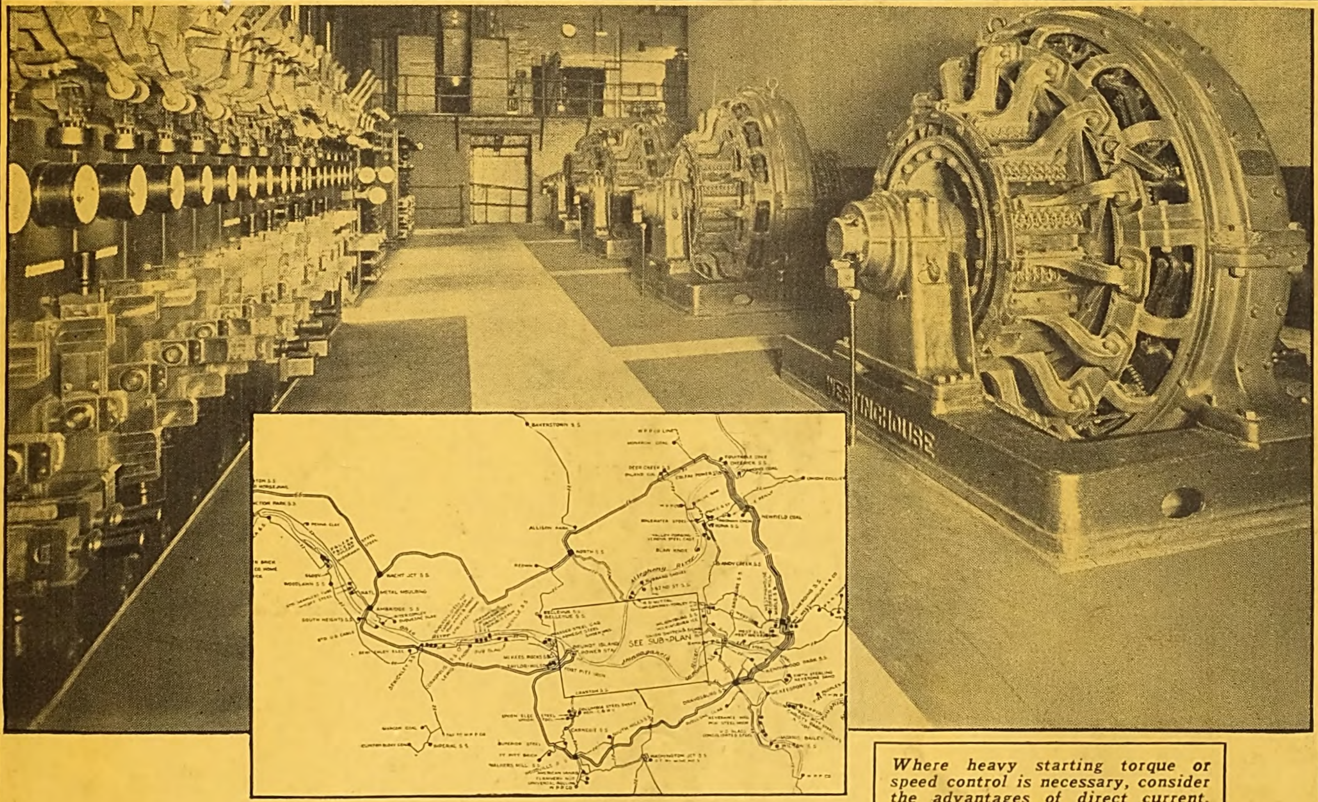
Westinghouse

X 81736

McGraw-Hill Co., Inc. June 6, 1925 Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL

WJu 8 '25



Where heavy starting torque or speed control is necessary, consider the advantages of direct current.

Duquesne defies interruptions

FURNISHING light and power to the entire Pittsburgh district, covering about 1000 square miles and serving 182 municipalities, the Duquesne Light Company, Pittsburgh, Pa., knows that practically 100% operation is essential. To guarantee uninterrupted service, the Duquesne Light Company relies on two key factors.

First—the company has completely surrounded the district with a unique 66,000-volt transmission ring, 80 miles in circumference, with three power plants. Energy is fed into the loop from both ends, and thus all company stations and high tension customers are provided with loop transmission lines fed from both ends. This has the great advantage that any section of the line may be isolated without interrupting the service on either side of the section.

Second—to maintain the certainty of service from its machines, the company uses National Pyramid Brushes. For instance, at 13th Street are five 2000-KW, 660-volt, 60-cycle, 450 RPM rotaries which feed the Pittsburgh Railway Company's lines. These machines are Westinghouse make and use NCC Grade 259 Brushes on the DC end, Ringsdorff ET-10 on the AC.

Our Service Engineers are ready to assist any company to insure the reliability of its electrical service or electrical machines through installation of correct brushes. Write, wire or telephone.

National
Pyramid Brushes

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, INC.

Carbon Sales Division

Cleveland, Ohio San Francisco, Cal.

Canadian National Carbon Co., Limited, Toronto, Ontario

Emergency Service Plants

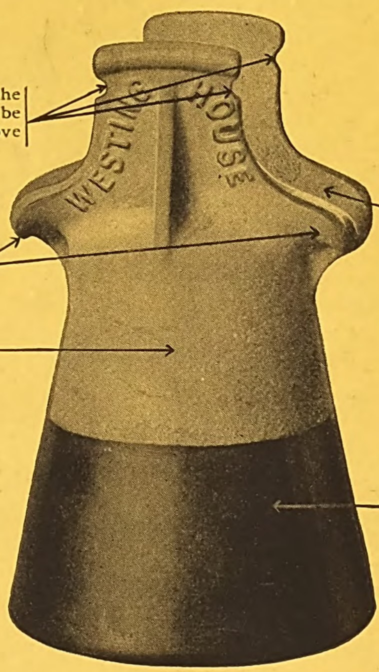
CHICAGO, ILL., 551 West Monroe St.
Phone: STAte 6092

PITTSBURGH, PA., Arrott Power Bldg. No. 3
Barker Place
Phone: ATLantic 3570

NEW YORK, N. Y., 357 West 36th St.
Phone: LACkawanna 8153

Armored Feeder Insulator

For Voltages up to 750, Test Voltage 10,000 Straight Line



Notches are provided at the top so that the feeder can be fastened securely in the groove with a tie wire.

Saddle top with a long bearing surface and easy radius, allowing an insulated cable to be supported with no danger of injuring the insulation.

Side projections which make it impossible for the cable to leave the groove.

Malleable-iron cap with a saddle top.

Moulded Insulation Body.

The fact that the lower half of the insulator is composed entirely of insulating material excludes the possibility of a ground, when this insulator is used.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

W
WESTINGHOUSE ELECTRIC

MEMBER
AMERICAN ELECTRIC RAILWAY ASSOCIATION
AERA

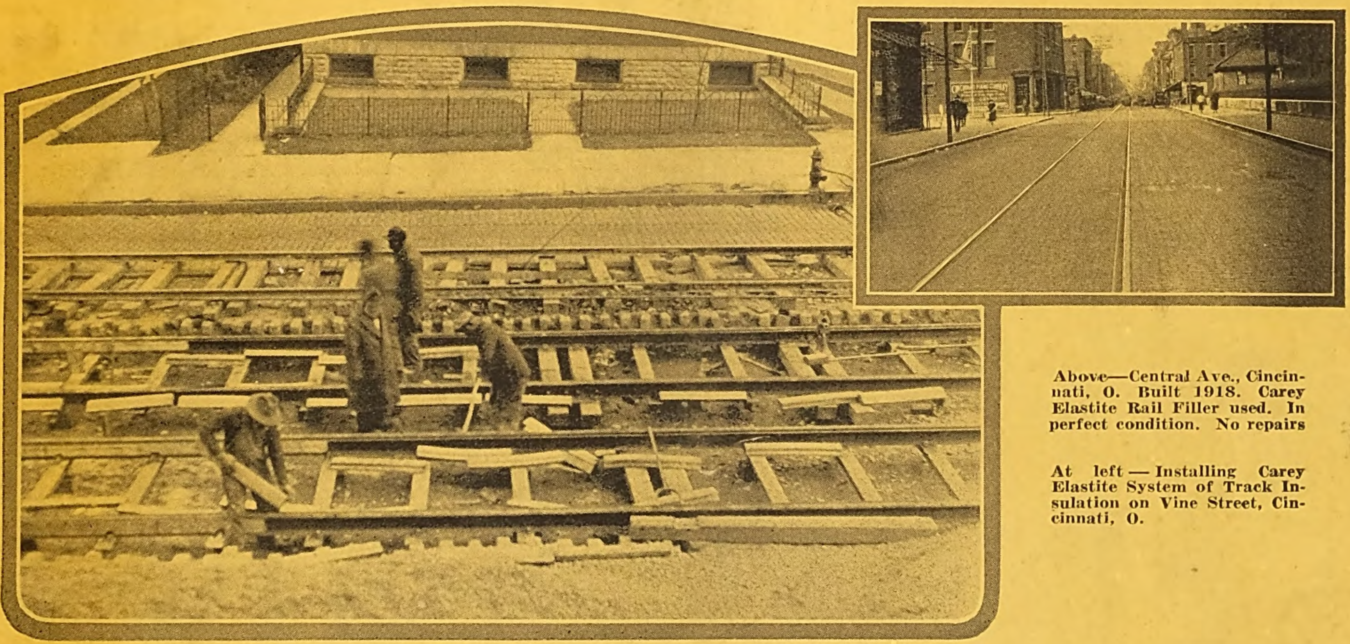
Westinghouse

X 80644

Ju 13 '25

McGraw-Hill Company, Inc. June 13, 1925 Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL



Above—Central Ave., Cincinnati, O. Built 1918. Carey Elastite Rail Filler used. In perfect condition. No repairs

At left — Installing Carey Elastite System of Track Insulation on Vine Street, Cincinnati, O.

Making Vine Street as Good as Central

Cincinnati was the proving-ground for the Carey Elastite System of Track Insulation. It was one of the very first cities to install Carey Elastite rail filler.

Years ago when Cincinnati relaid the wood block paving of Central Ave., Carey Elastite Rail Filler was used. Despite the heavy downtown traffic, not a block has been displaced by rail vibration, traffic-impact, or frost. The street is as smooth and watertight as the day it was laid.

The Carey Elastite System of Track Insulation—greatly improved since Central Avenue was built—was used in the reconstructing of other Cincinnati streets. Vine Street was made as good as Central Avenue. The street railway company will save money thru decreased maintenance costs and prolonged life of pavement.

THE PHILIP CAREY COMPANY
53 Wayne Avenue, Lockland, Cincinnati, O.

Send for complete data and typical construction plans.

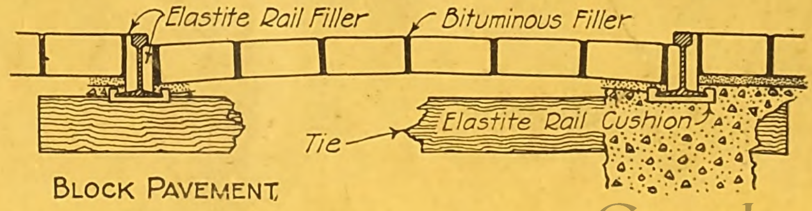
Elastite Rail Filler is Easy to Install

a tap of a mallet holds it in the web of the rail.

Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail vibration and traffic-noise. It is preformed to fit any rail-section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

Carey Elastite

SYSTEM OF TRACK INSULATION



Another Good Reason

WHEN the Norfolk & Western, the Virginian, and other heavy-grade, large capacity roads electrified, their one thought was to accomplish more work with a greater efficiency.

In addition to hauling heavy loads up grade, useful work is accomplished on down grades by the locomotive holding heavy trains without the use of brakes, at a saving in fuel consumption and a reduction in air brake and mechanical parts maintenance.

This feature—Regeneration—goes hand-in-hand with Electrification and is Another Good Reason why the best, cleanest and most efficient servant—Electricity—should be working for you on your road, just where the work is hardest.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION
A E R A C T AERA

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

W
WESTINGHOUSE ELECTRIC

Westinghouse

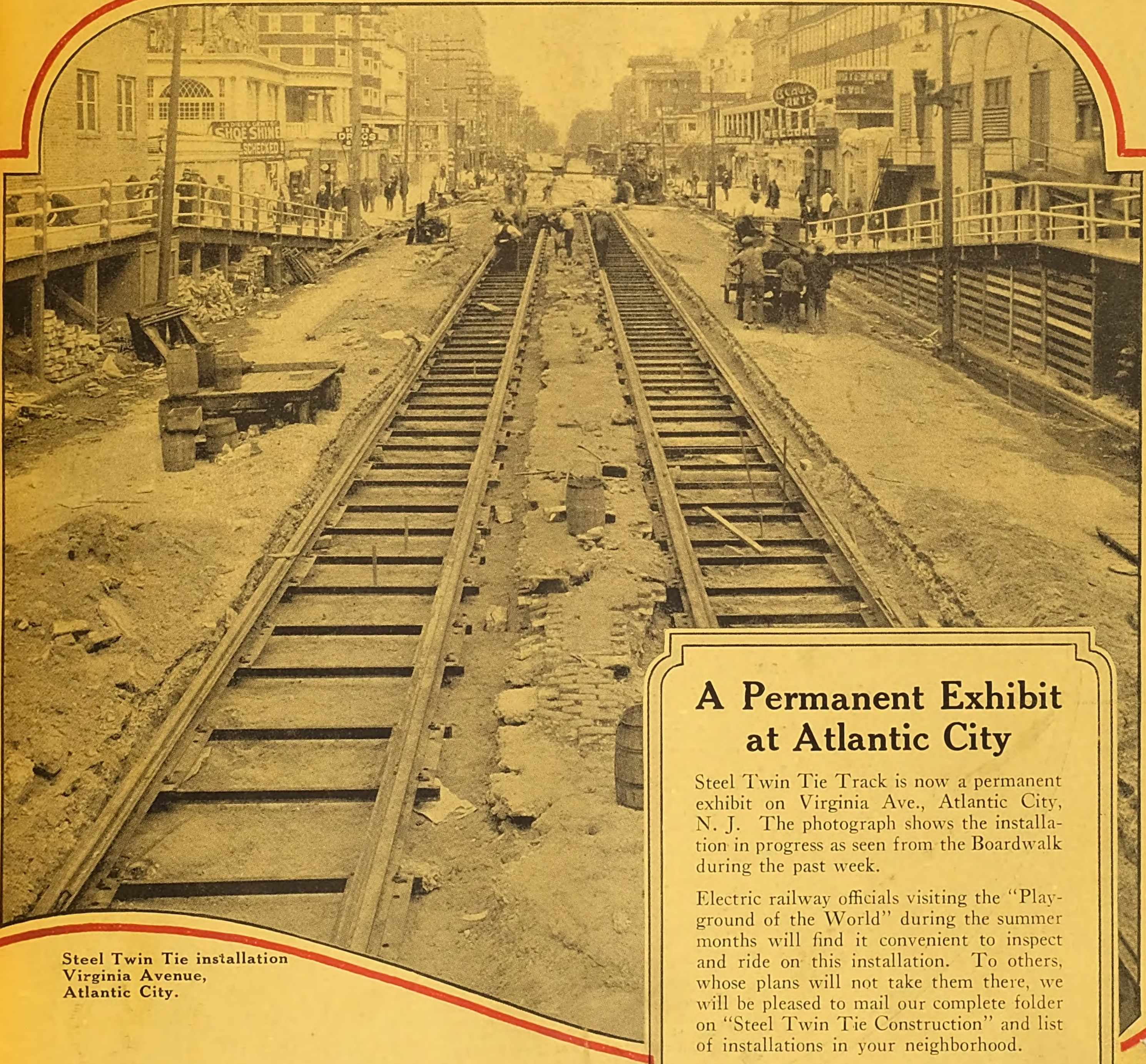
X 81735

MAINTENANCE ISSUE

ELECTRIC RAILWAY JOURNAL

June 20, 1925

Ju 22 '25



Steel Twin Tie installation
Virginia Avenue,
Atlantic City.

A Permanent Exhibit at Atlantic City

Steel Twin Tie Track is now a permanent exhibit on Virginia Ave., Atlantic City, N. J. The photograph shows the installation in progress as seen from the Boardwalk during the past week.

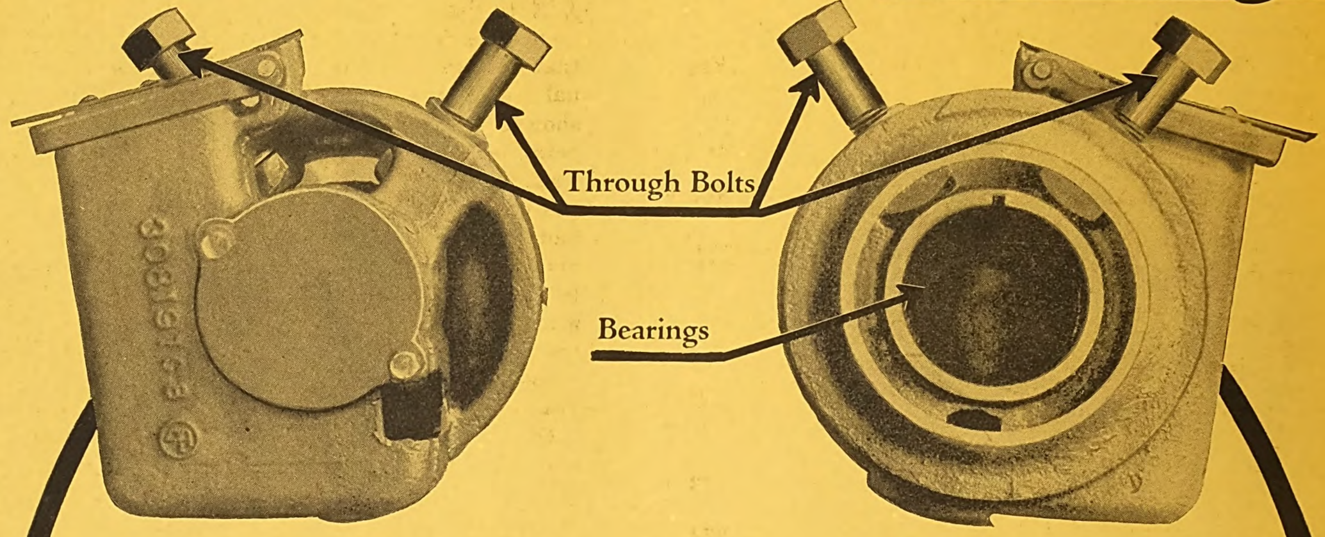
Electric railway officials visiting the "Playground of the World" during the summer months will find it convenient to inspect and ride on this installation. To others, whose plans will not take them there, we will be pleased to mail our complete folder on "Steel Twin Tie Construction" and list of installations in your neighborhood.

The International Steel Tie Co.
Cleveland, Ohio.

Steel Twin Tie Track

Renewable Track — Permanent Foundation

Railway Renewal Housings



Westinghouse Renewal Housings, which embody most of the characteristics found in the housings of modern Westinghouse Railway Motors, have been developed for many of the older types of Motors.

Be sure that the Renewal Housings you buy embody the following points:

Through Bolts—Proper Bearing Fit—Material which may be easily repaired.

Cast-Steel Housings are the best. Malleable Iron has very good wearing qualities.

Both standard and over-size housings can be furnished. Standard size for unworn frame fits. Oversize for worn frame fits which must be bored out.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION

WESTINGHOUSE ELECTRIC

Westinghouse

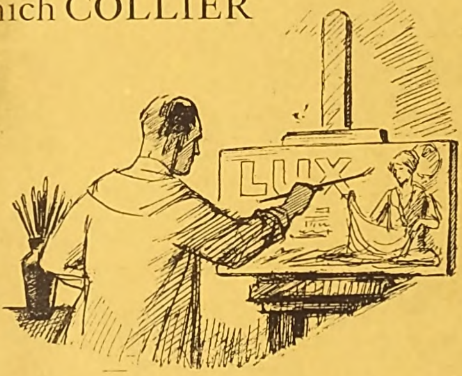
X 78479

Ju 29 '25

ELECTRIC RAILWAY JOURNAL

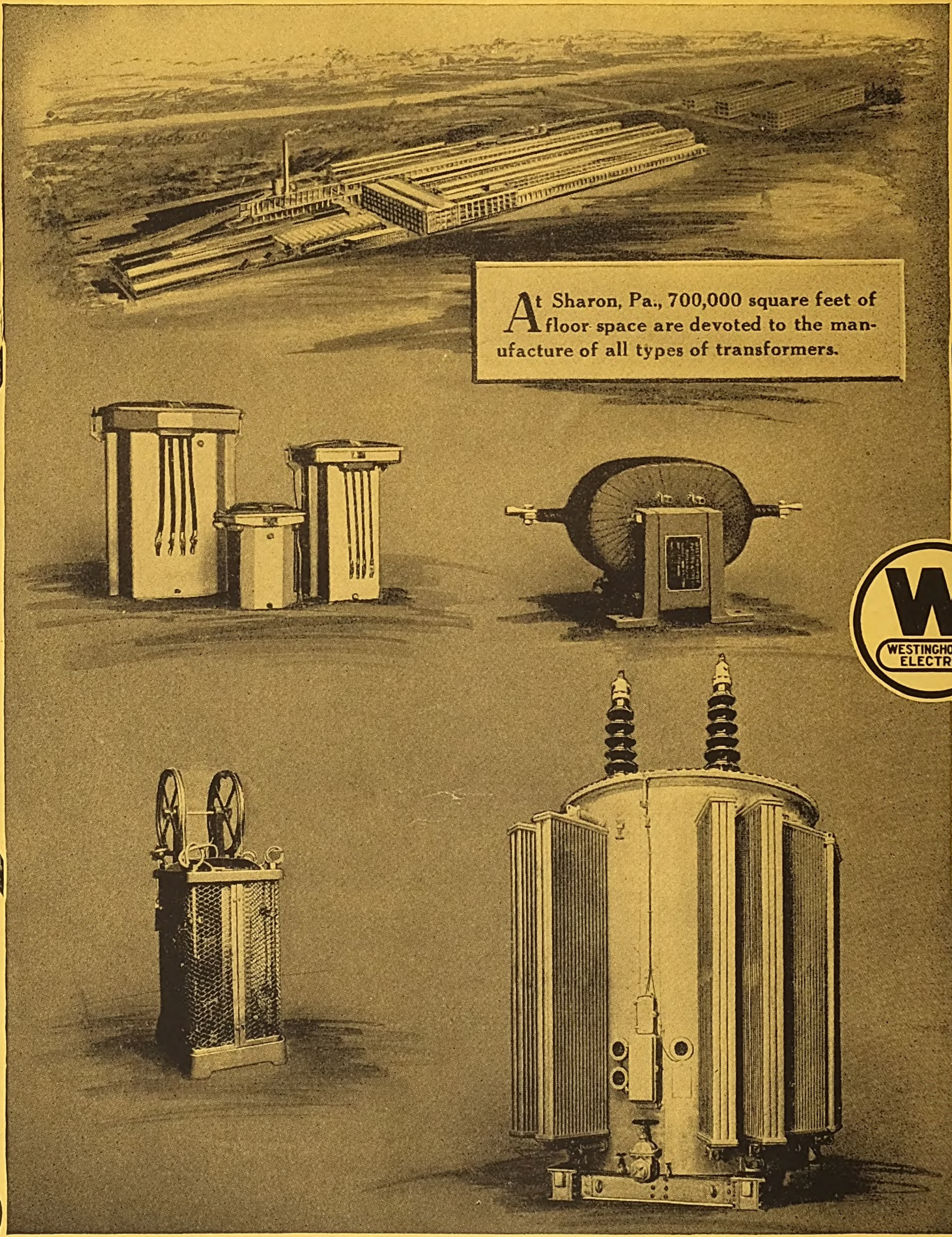
McGraw-Hill Company, Inc. June 27, 1925 Twenty Cents per Copy

JUST as it has taken years of faithful adherence to ideals of service to build and maintain the street car lines—so has it taken years of faithful study and application to build into Car Card Advertising the value which COLLIER SERVICE has created.



Barron G. Collier
INCORPORATED
Candler Bldg., New York

The New Westinghouse Transformer Works



At Sharon, Pa., 700,000 square feet of floor space are devoted to the manufacture of all types of transformers.

WESTINGHOUSE ELECTRIC

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Westinghouse Electric & Manufacturing Company
Sharon Works Sharon, Pa.
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse

X 81701

JOHN A. MILLER, Jr.
Associate Editor
C. W. SQUIER
Associate Editor
G. J. MACMURRAY
News Editor

ELECTRIC RAILWAY JOURNAL

HENRY W. BLAKE
Senior Editor
CHARLES GORDON
Western Editor
7 S. Dearborn St., Chicago
CARL W. STOCKS
Associate Editor

MORRIS BUCK, *Managing Editor*

Vol. 65
No. 26

CONTENTS

Pages
1001-1036

June 27, 1925

Editorials 1001

Car Riding Increased 28 per Cent...............1003

New Brooklyn cars increase schedule speed due to better acceleration and retardation and decreased loading time. Lesser weight and better schedules reduce energy consumption. Other features are incorporated in last cars delivered.

Handling Freight on Aroostook Valley Line.....1007

New 60-ton electric locomotive recently built for this service has interesting features. Severe winter weather presents an operating problem.

Automatic Derail Protects Steep Grades........1008

Time lag of ten seconds between making connection at the contactor and operation of the switch necessitates cars coming to a dead stop.

Electric Railways Keep Pace in Rapidly Growing Texas Cities 1009

BY CHARLES GORDON.

Local street railway lines and interurbans have played an important part in the development of Houston, Dallas, San Antonio and Fort Worth. A spirit of co-operation has been built up by close attention to the public demands. Buses are operated by railways in Houston and San Antonio.

Sand Outlets Attached to Trucks on Interurban Cars 1014

"Crimson Limited" Gives Attractive Interurban Service 1015

Northern Texas Traction Company improves cars for Fort Worth-Dallas, non-stop service with a special view to merchandising. Combination of colors used to give streamline effect.

Experience with Surface Hardened Rail in Toronto 1016

Association News and Discussions.............1017

United States installations small, although comprising 25 per cent of world's total. Standardization of system considered essential. Electric railway men among new officers of the association.

Public Utility Storekeeping 1018

BY K. C. CAMPBELL.

Maintenance of Equipment 1020

Operating Rear Door from Any Point in Car...............1020
Punch and Die for Forming Journal Box Covers............1020
BY T. E. WOOD.
Engine Raised Auto Tower 1020
Maintenance Practices on the Pittsburgh Railways..........1021
New Equipment Available 1022

The News of the Industry 1023

City Will Buy Phœnix Railway Equipment................1023
Mail Pay Case Decided 1023
Seeks to Drop Fare Litigation in Philadelphia...............1024
Strong Case by Dissenting Arbitrator......................1027
Recent Bus Developments 1029

Financial and Corporate 1031

$54,965 Balance at Indianapolis 1031
City Begins Its Side on Baltimore Valuation 1032
New Company to Hold Virginia Properties 1032

Personal Mention 1034

Manufactures and the Markets.................1036

Saving Your Time

ONE of the most important features of any business paper is its reference value to its subscribers. The staff of ELECTRIC RAILWAY JOURNAL is always willing to locate articles for its readers. Many requests of this kind are received and all are given prompt attention, but at best some time must elapse before the answer can reach the inquirer. Even the shortest delay may mean considerable inconvenience to the person waiting for information.

Accordingly the publishers have placed at the disposal of each reader the means of locating articles for himself in a minimum of time. Each week the articles are listed in the contents, and twice a year at the close of the volume a complete subject index is published. The index for Vol. 65 is complete in this issue. The subscriber is thus enabled to have his volume bound complete with the index immediately thereafter.

In case the reader does not bind the volumes but files the issues for future reference, the indexes may be placed conveniently at hand and thus be readily available for reference should it be desired to locate any particular article. Reference to the table on the first page of the index indicates the date of the issue in which a given page number was published. Complete instructions are also given on how to use the index.

The value of the JOURNAL index is in the time it saves and the inconvenience it eliminates for the reader.

McGRAW-HILL COMPANY, INC.
Tenth Avenue at 36th Street, New York, N. Y.

JAMES H. MCGRAW, President
ARTHUR J. BALDWIN, Vice-President
MALCOLM MUIR, Vice-President
EDWARD J. MEHREN, Vice-President
MASON BRITTON, Vice-President
JAMES H. MCGRAW, JR., Vice-Pres. and Treas.
C. H. THOMPSON, Secretary

WASHINGTON:
Colorado Building
CHICAGO:
7 S. Dearborn Street
PHILADELPHIA:
Real Estate Trust Building
CLEVELAND:
Leader-News Building
ST. LOUIS:
Star Building
SAN FRANCISCO:
883 Mission Street
LONDON:
6 Bouverie Street, London, E. C. 4
Member Associated Business Papers, Inc.
Member Audit Bureau of Circulations

Cable Address: "Machinist, N. Y."

Publishers of
Engineering News-Record
American Machinist
Power
Chemical and Metallurgical Engineering
Coal Age
Engineering and Mining Journal-Press
Ingeniería Internacional
Bus Transportation
Electric Railway Journal
Electrical World
Electrical Merchandising
Radio Retailing
Journal of Electricity
(Published in San Francisco)
Industrial Engineer
(Published in Chicago)
American Machinist—European Edition
(Published in London)

The annual subscription rate is $4 in the United States, Canada, Mexico, Alaska, Hawaii, Philippines, Porto Rico, Canal Zone, Honduras, Cuba, Nicaragua, Peru, Colombia, Bolivia, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala and Paraguay. Extra foreign postage to other countries $3 (total $7 or 29 shillings). Subscriptions may be sent to the New York office or to the London office. Single copies, postage prepaid to any part of the world, 20 cents.
Change of Address—When change of address is ordered the new and the old address must be given, notice to be received at least ten days before the change takes place.

Copyright, 1925, by McGraw-Hill Company, Inc.

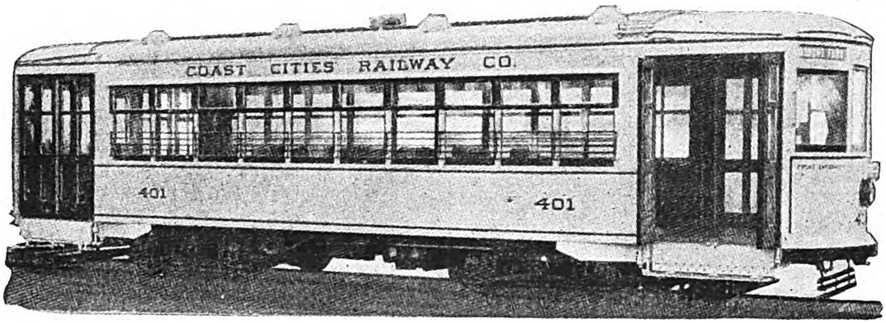
Published weekly. Entered as second-class matter, June 23, 1908, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Number of Copies Printed, 6,300

Advertising Index—Alphabetical, 64; Classified, 60, 62; Searchlight Section, 59

The Modern Light-Weight Electric Street Car The Hub of the Industries Service

It is the only solution for city transportation and street congestion problems



Rapid Acceleration

Comfort and Convenience

When the Traffic Officer says "Go"

the modern light-weight car leads the vehicular procession over the crossing to the next traffic point.

Powered with four Westinghouse motors, every wheel is working to push the car forward. The acceleration of the car is not only rapid but smooth, due to the carefully-designed control and rheostat.

The interior of the car is pleasing; the atmosphere is ventilated and the passenger, in a comfortable seat, may read the day's paper.

The motorman prefers rapid acceleration because it assists him to keep on schedule time in congested traffic.

Operating companies that have adopted these cars know this type of car, on any property, means better operation and increased net earnings.

Ask the Westinghouse representative for further information.

MEMBER AERA

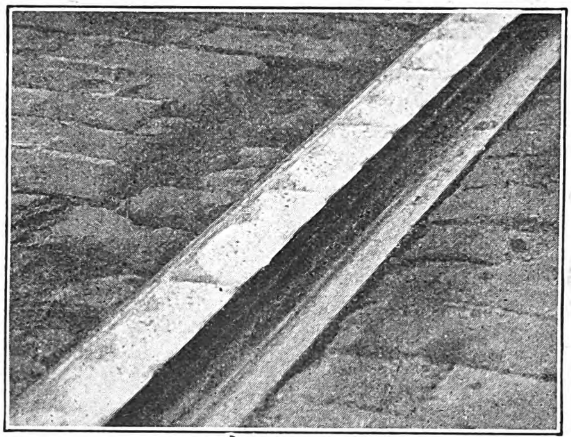
Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Increased Patronage

W
WESTINGHOUSE ELECTRIC

Westinghouse

X81789



The cost of removing these corrugations is least with RECIPROCATING GRINDERS

Get Cost Figures Right

THE actual total cost of removing corrugations, with due consideration for the kind of results obtained, will invariably work out in favor of the "RECIPROCATING" GRINDER.

WHY?

First, because it does the work thoroughly and completely where corrugations are deep. Its work can be concentrated at any given spot and corrugations removed completely.

Second, it does the work rapidly, and no less thoroughly where corrugations are light.

Third, it does not waste time and rail material running back and forth over track where corrugations have not yet appeared.

Fourth, it can be operated by track laborers at track laborer's day-time wages—no night overtime or high-priced men to pay. It does not interfere with traffic.

Fifth, rail-head is re-shaped to its original contour, clear over to the gage line.

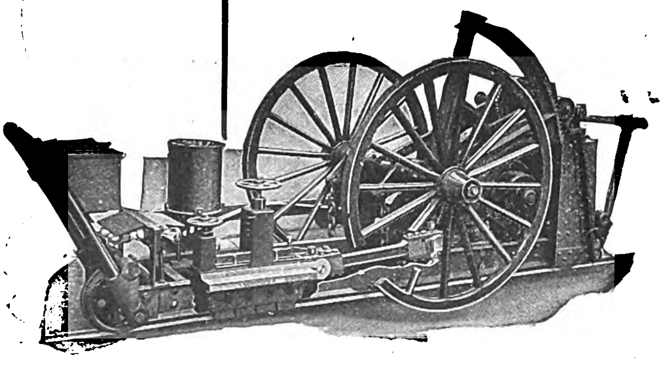


Figure Costs Right

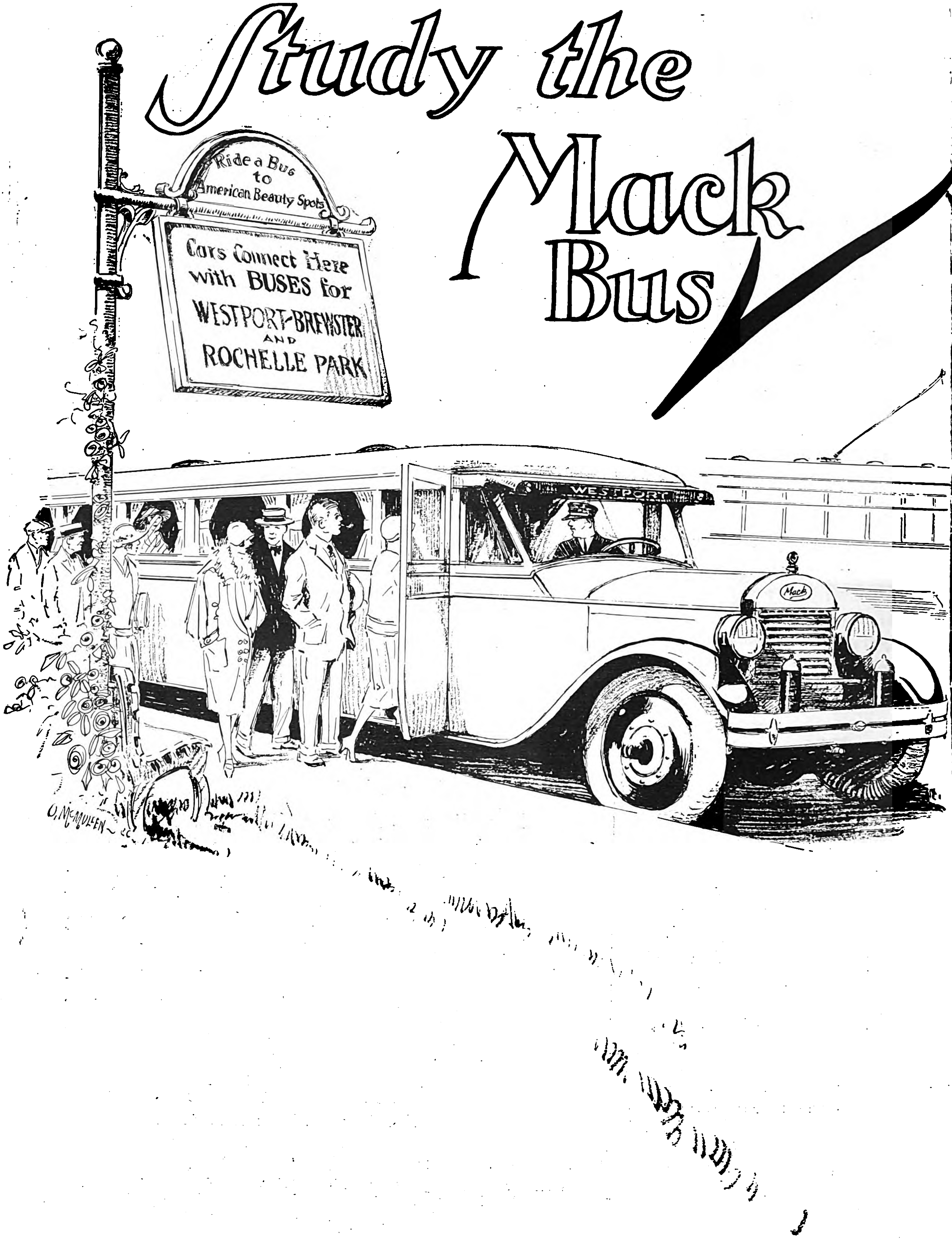
What you want is lowest cost per foot of actually corrugated rail ground perfectly smooth—*not* merely low cost per foot of total trackage passed over, *nor* merely low cost of partly removing corrugations. There is a big difference. Figured accurately, cost of removing corrugations is always lowest on the many roads which depend upon and use their Reciprocating Grinders. Would you like further data?

Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Atlas Railway Supply Co., Chicago
Equipment & Engineering Co., London


Study the Mack Bus
Ride a Bus to American Beauty Spots
Cars Connect Here with BUSES for WESTPORT-BREWSTER AND ROCHELLE PARK
WESTPORT
Mack
O. McMULLEN

as a key to the profitable "summer traffic" field

THE call of the great out-doors invites tourists and pleasure-seekers to ride buses.

The bus route is the scenic route. The winding ribbon of highway beckons, slipping smoothly between hill and valley. Glimpses of sun-lit spots and cool shadowed nooks flash by. And relaxing in a comfortable seat, the passenger who rides in a Mack Parlor Car Bus mentally thanks the electric railway that places such service at his disposal.

The call of the great out-doors is a call to railways to increase revenue and build good-will by extending bus service to the garden spots of recreation adjacent to their routes.

Unquestionably, Mack Buses are a logical choice when it comes to deciding on equipment.

Mack has the all-bus chassis.

Mack has the Shock Insulator Suspension whereby all spring ends are embedded in cushions of live resilient rubber, which effectively absorbs all minor crystallizing road shocks.

Mack has the famous improved Mack engine, and a score of other features that contribute to passenger comfort and operating economy.

Chapter 7 of Bus Operation Practice, the Mack 200-page manual of bus operation, treats in detail with the question of promoting summer and feeder traffic. You can secure a copy by communicating with the nearest Mack Branch or direct with our general offices at 25 Broadway, New York.

How about getting a first-hand picture of how a Mack bus will operate over your route? Your nearest Mack branch will gladly arrange to take care of you with a demonstration. Why not call up and set a time?

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 Broadway, New York City

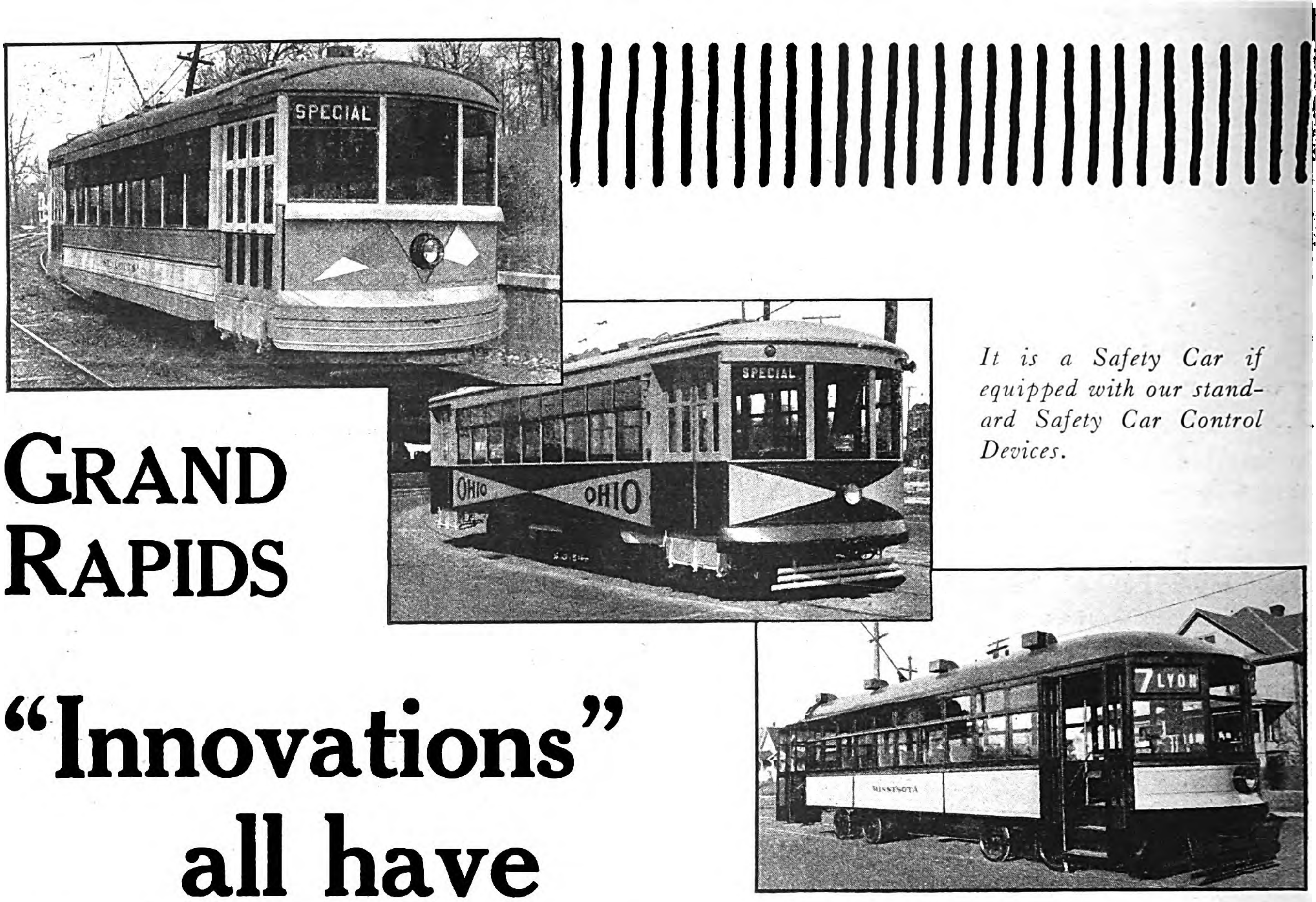
Eighty-eight direct MACK factory branches operate under the titles of "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION" AND "MACK MOTOR TRUCK COMPANY"

The Mack Bus

The Lehigh Valley Traction Company of Allentown, Pa., recently purchased thirteen 25-passenger City Type buses similar to the one illustrated. Ten of these will be used on feeder lines to their present service in Hazleton, Pa., and the other three will be operated between Bethlehem and South Bethlehem.

—Mack Standard Types—
City Bus 25 passenger.
City Bus 29 passenger.
Parlor Car Bus.
Sedan Bus.

Performance counts!



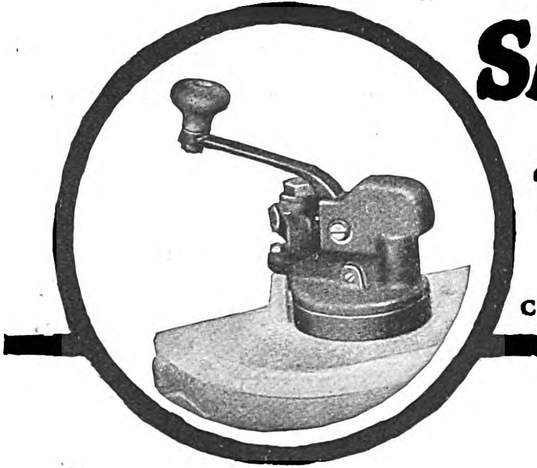
GRAND RAPIDS

It is a Safety Car if equipped with our standard Safety Car Control Devices.

"Innovations" all have *Standard Safety Car Control*

Safety Cars have been operating long enough in Grand Rapids to demonstrate the advantages of this type of transportation—the one-man-operated car properly protected by labor-saving and safety elements, as embodied in the Safety Car Control Equipment—and 70% of the service is of this type. Contemplated purchases will bring this up to 90%.

Although the three sample light weight cars recently put into service by this company differ radically from previous types of cars in many elements of design and equipment, yet, they all have the standard Safety Car Control—a significant indication of confidence in the equipment that has proved its merits by long and extensive service.

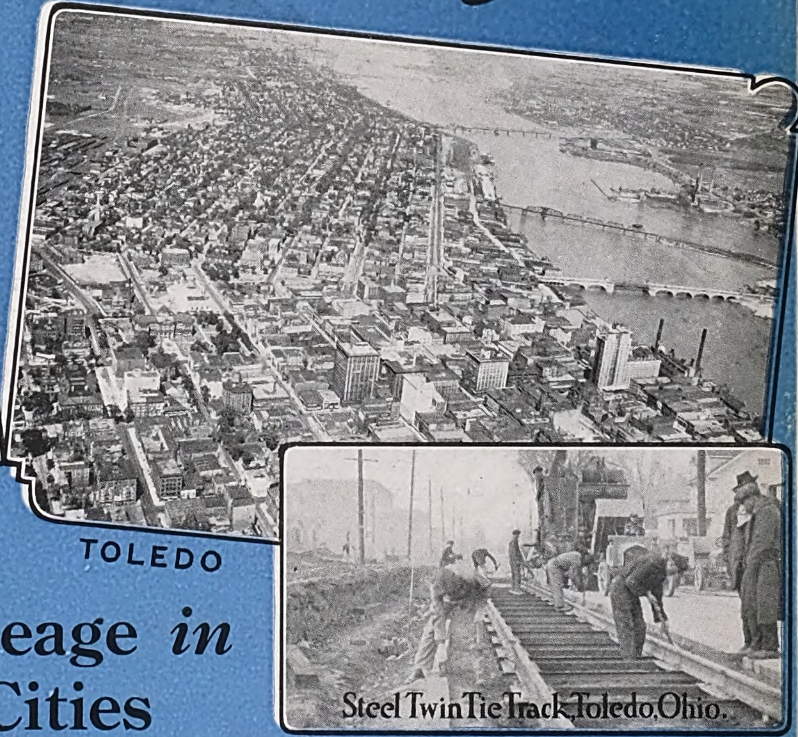


SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

Steel Twin Tie Track on representative and prosperous railways

DETROIT

Steel Twin Tie Track, Detroit, Mich



TOLEDO

Steel Twin Tie Track, Toledo, Ohio.

Big Mileage *in* Big Cities

The best evidence of the quality Steel Twin Tie Construction is in our list of users and in their records.

May we suggest you designate one of your organization to investigate Steel Twin Ties and report?

KANSAS CITY

Steel Twin Tie Track, Kansas City, Mo.

PORTLAND

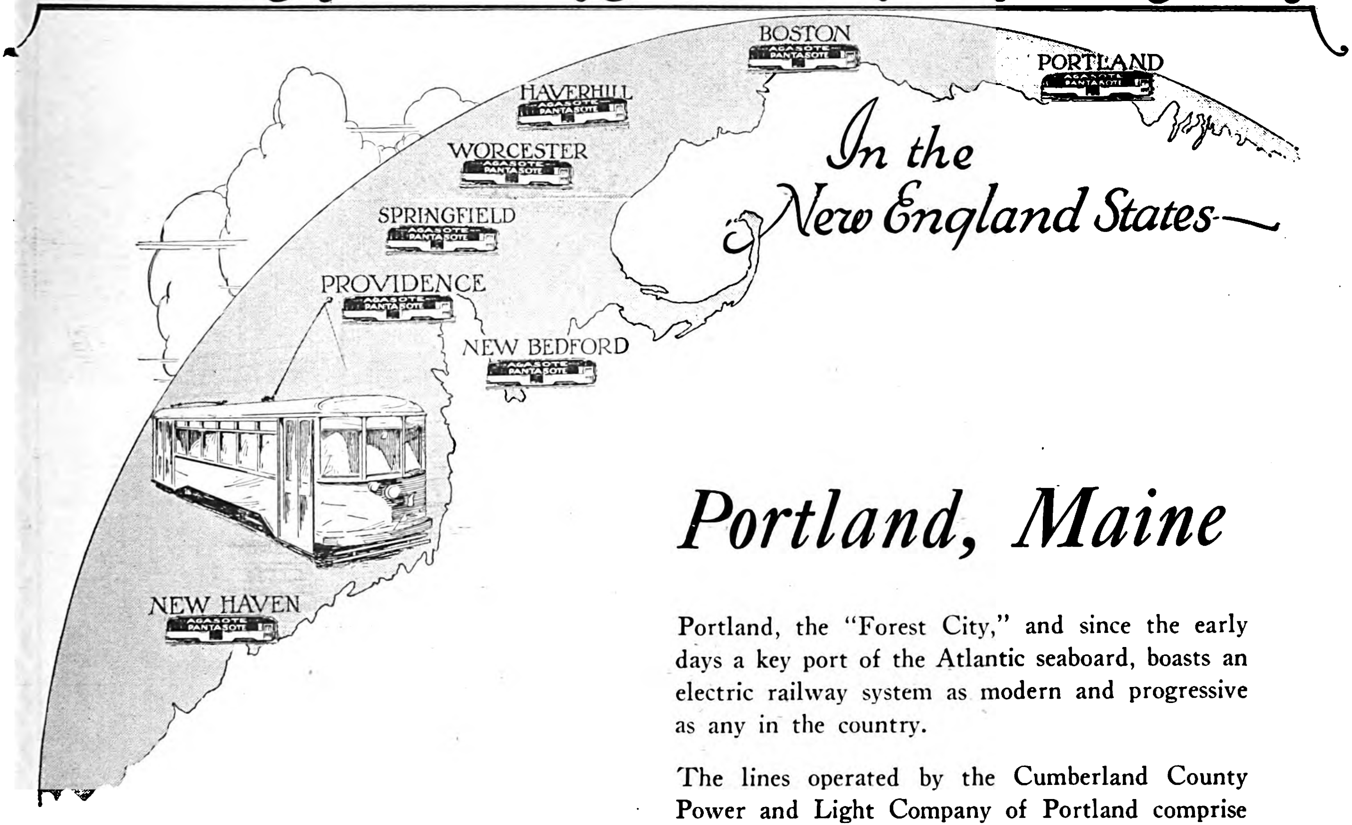
Steel Twin Tie Track, Portland, Ore.

**The International
Steel Tie Company
Cleveland, O.**

Steel Twin Tie Track

Renewable Track · · Permanent Foundation

Covering the country with Pantasote and Agasote



In the New England States—

Portland, Maine

Portland, the "Forest City," and since the early days a key port of the Atlantic seaboard, boasts an electric railway system as modern and progressive as any in the country.

The lines operated by the Cumberland County Power and Light Company of Portland comprise both city and suburban services aggregating some 105 miles of trackage. And in company with the majority of well-established operators they have from the first consistently specified Pantasote and Agasote.

Judged on the sound basis of proved last cost economy Pantasote Products become a logical choice. The fact that they almost invariably last for the life of the car, through storm and shine, heat and cold, compensates many times for their slight extra cost. More than a quarter century of practical proof stands back of the facts that Pantasote curtains and seats will not crack, harden or flake and that Agasote headlinings, roofs, wainscotings, etc. are virtually indestructible.

Specify Pantasote and Agasote. Insist upon getting them for new cars, for rehabilitation. In the end it always pays!

Next week we will take you to the Middle West where Pantasote and Agasote have grown up with the electric railway industry and are now almost exclusively specified.

Pantasote Products *would* not be so universally used *unless* Economy prevailed *after all*!

Specify them for your buses also!

Warning!
There is no substitute for Pantasote

The PANTASOTE COMPANY Inc.
At 46th Street 250 Park Avenue
NEW YORK
Pantasote Products for Both ELECTRIC RAILWAYS AND BUSES

BATES **POLES**

Every practical consideration suggests Bates Poles

Bates Steel Poles embody every practical advantage that can be looked for in a supporting structure. They are obtainable on short notice, and easily transported and erected. They are easily protected by painting against the attack of rust, as all surfaces are exterior. Strength and freedom from deterioration give them long life, and even their first cost is surprisingly low. The illustration above is part of the electrified division of the Erie R.R. along the State Barge Canal at Rochester, N. Y. Mr. R. C. Thurston, Supervisor of electrical service at Avon, N. Y. states his preference for Bates Poles, "because they are strong, convenient, and economical." On every type of supporting structure for electrical service, a Bates estimate will be interesting and valuable to you. Let Bates engineers figure on your requirements.

Expanded Poles, Fabricated Towers or Substations—Painted or Galvanized

Bates Expanded Steel Truss Co.
231 SOUTH LA SALLE ST., CHICAGO, ILL.

Behind the Bus—Efficient Terminal Buildings

TEN vital questions must be answered before you start your new bus terminal.

The Austin Company has prepared a special folder on motor bus terminals, from its large fund of experience already gathered in this comparatively new field. It is designed to help the executive who is approaching the subject of building better terminal facilities to back up the buses.

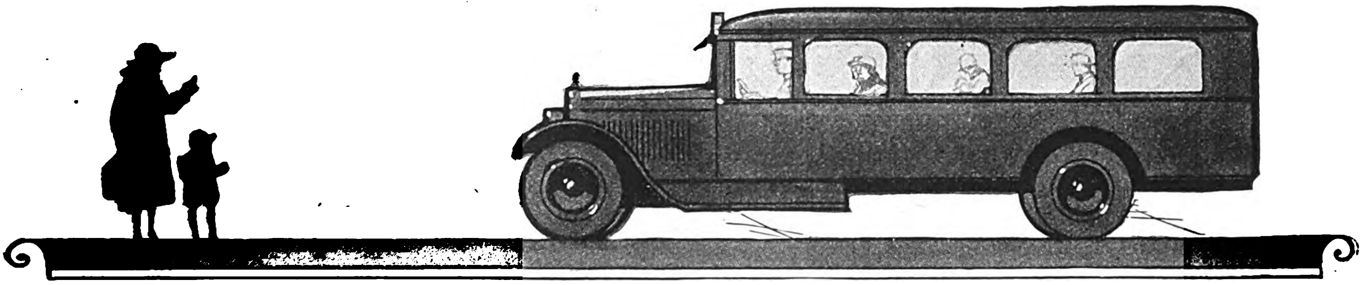
Austin's experience in the design and construction of bus terminals is backed by many years' experience in the economical design and efficient layout of railroad and industrial buildings.

Housing and maintaining buses at a minimum capital expense to obtain a maximum return, is the direct result of the well known Austin Method applied to this problem. The good results obtained from Austin-built terminals are a matter of record, and constitute the real reason why Austin is now busy constructing motor bus terminals throughout the country.

Wire, phone the nearest office in Austin's nation-wide organization, or send the coupon for your copy of "FACTS about the Design and Construction of Motor Bus Terminals."

THE AUSTIN COMPANY—Engineers and Builders—CLEVELAND

New York Cleveland Pittsburgh St. Louis Chicago Philadelphia Seattle Portland Detroit Birmingham Kansas City
The Austin Company of California: Los Angeles and San Francisco. The Austin Company of Texas: Dallas.



AUSTIN

FINANCE • DESIGN • CONSTRUCTION • EQUIPMENT

The Austin Company,
Cleveland.

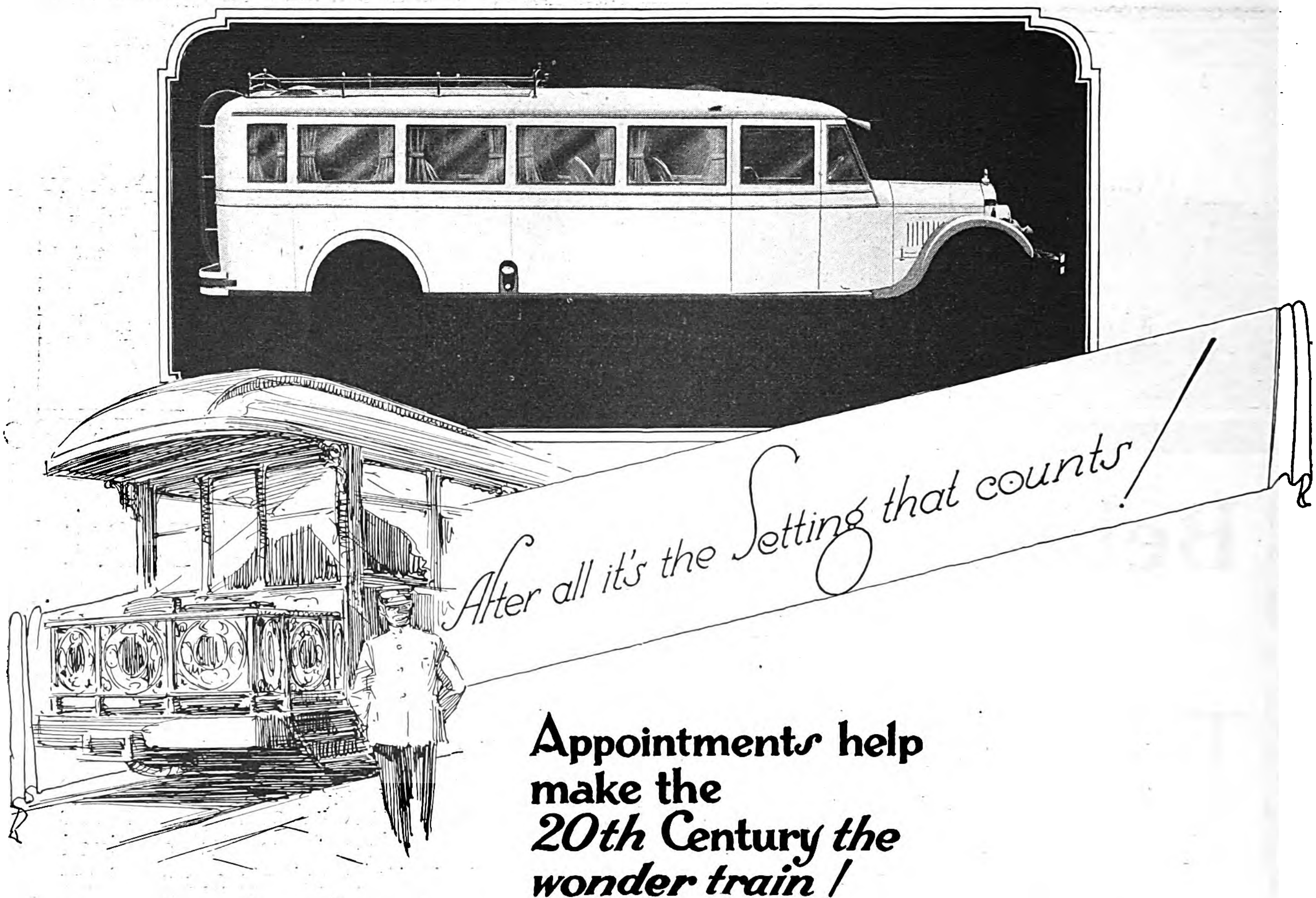
Please send "FACTS About the Design and Construction of Motor Bus Terminals" to

Firm ....

Individual ....

Address ....

E R J 7-25


After all it's the Setting that counts!

Appointments help make the *20th* Century *the wonder train!*

Speed, of course, identifies the 20th Century Limited as the crack train of the New York Central, but its reputation also is built on appointments contributing to passenger comfort and convenience.

It is much the same with the modern motor bus. Mechanical engineering features of chassis design must be supported by appointments contributing to passenger comfort—and this means the *body*.

Lang Bodies, in design and workmanship, have established the standard in body building—for quality and for improvements. Quality once attained must be maintained.

Backed by 48 years of experience, equipped to execute quality work and keenly alert to every development in the bus industry, the Lang organization is exerting a widespread influence in motor coach design, just as years ago it set the standard for fine carriage building.

"Bodies by Lang" is a recommendation founded on supremacy.

We extend a most cordial invitation to come to the Lang Body plant and inspect the latest models in body design at every stage in their construction.

LANG BODIES

Miles of Smiles
for Rider for Driver for Owner

"A Body for every chassis"
Deluxe Sedan
Parlor Car and
Street car —
Types

THE LANG BODY COMPANY · CLEVELAND — O.

Meeting the Responsibility of a New Age of Transportation

ALONG with all the opportunity for profit in the rapid expansion of bus transportation, the farsighted bus operator realizes his responsibility in hastening its success.

He knows that the public must be made to look on this modern method of travel as a safe, prompt, dependable service.

He gives careful consideration to the tires that determine to a great degree the reputation of his bus service.

It is natural that bus operators are attracted to the U. S. Royal Cord Bus-Truck Tire as the ideal tire for their particular needs.

Here is a tire that U. S. Rubber Company engineers have developed after years of careful study of just what bus service demands.

The Royal Cord Bus-Truck Tire was the first pneumatic *specifically* designed for bus service. The first to carry the word "Bus" on the tire.

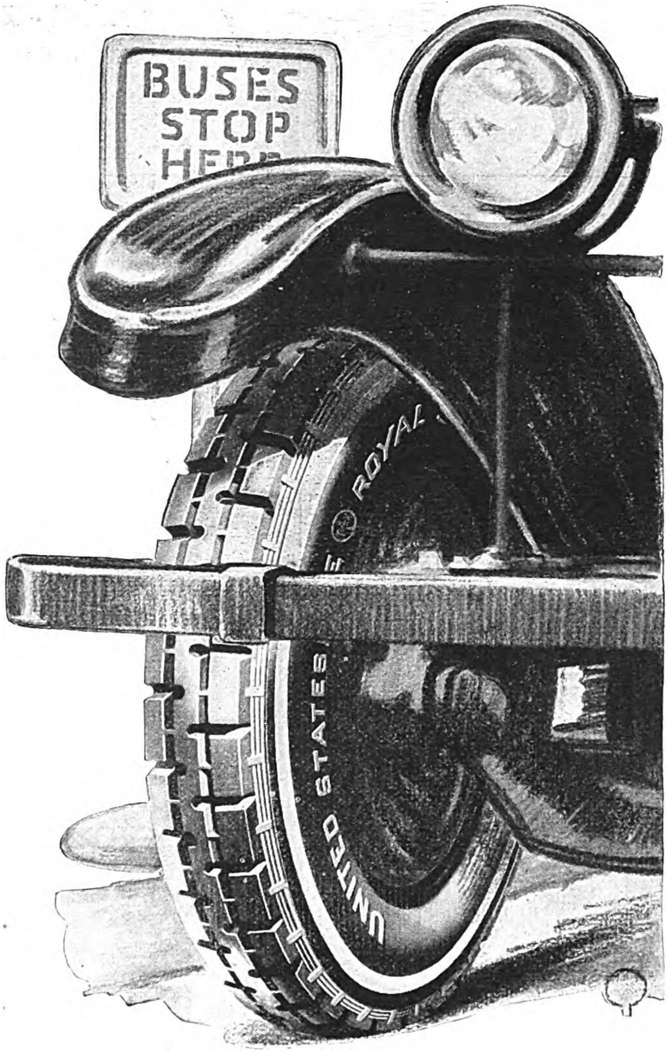
Through the invention of Latex-treated Web Cord, this tire has a construction advantage that has established its leadership.

This construction, patented and owned by the U. S. Rubber Company, gives a combination of strength and flexibility that is essential to long-service cushioning in bus tires.

The special adaptation of the famous Royal Cord tread affords traction and safety that make operation more economical and handling more certain.

You owe it to yourself, your customers and the future of bus transportation to get the superior service of U. S. Royal Cord Bus-Truck Tires.

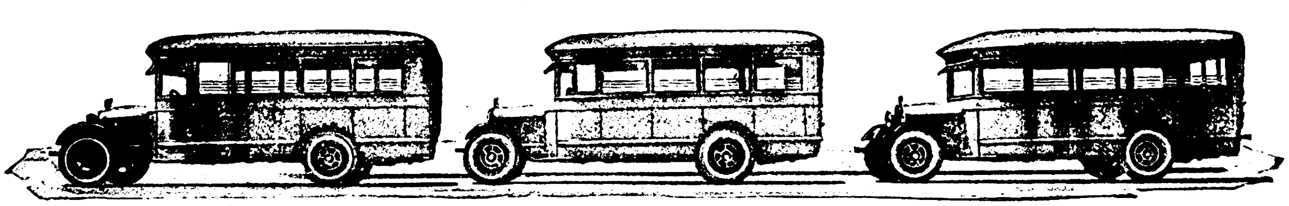
United States Rubber Company



Getting at the Real Facts

In order to have a complete understanding of all the facts concerning bus operation, the United States Rubber Company maintains groups of tire experts in every part of the country. They are making a day-to-day study of bus operation in their respective localities. Their reports are the basis on which information is made available to bus operators to help them get the best service from their tire equipment.

Trade US Mark



These Graham Brothers Buses, operated by the Texas Electric Railway Co., are fully equipped with U. S. Royal Cord Bus-Truck Tires.

UNITED STATES BUS-TRUCK TIRES ARE GOOD TIRES

GAS-ELECTRIC DRIVE MEANS

When other buses have reached the end—

—yours will still be good for many years. Freed from the vibration of an over-speeding engine—without the recurring shocks of clutch engagements and gear shifts—entire bus equipment and body are assured much longer life by

Gas-Electric Drive

(for buses and trucks)

Before you buy buses consult the General Electric Company regarding your service and grade conditions.

GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

LOWER COST FOR BETTER TRANSPORTATION

MAINTENANCE and depreciation allowances mean much more in bus costs than do gasoline, oil and tires. Many owners of buses—and automobiles—fail to realize that until it is too late.

Bus operators have been startled to find that three to five years spell the end of the average bus. What more can be expected of any equipment shaken with vibration, and strained by thousands of gear shifts per day!

Gas-Electric Drive has changed all this. Smooth and fast, quiet and powerful, strong and highly efficient, it offers real economies in bus transportation, unattainable by mechanical drives.

Maintenance Advantages

Inspection and testing of engine are simplified, made systematic and conclusive.

Engine cannot be raced or stalled and average engine speed is lower—prolonging life of bearings, pistons, cams and all other moving parts.

Clutch, gears and differential—all subject to high maintenance—are eliminated.

Without the shock of gear changing, the life of engine, chassis and body is longer.

Uniform torque of electric drive means less tire wear.

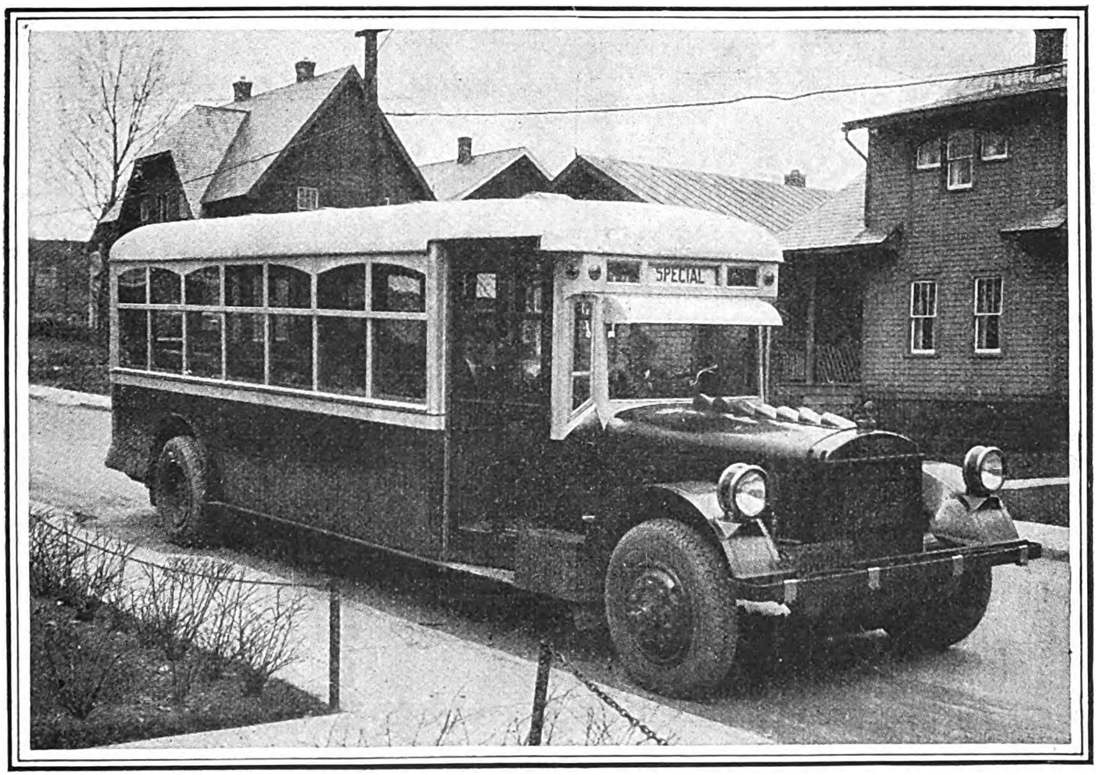
Engine lubrication is materially less.

Operating Advantages

Greater riding comfort—no vibration or jerks during starting, and smooth acceleration.

Increased safety—control entirely in foot pedal relieves operator's hands for steering—skidding is minimized by individual drive on rear wheels—engine cannot stall on dangerous crossings.

Higher schedule speeds—through more rapid acceleration and reduction of driver fatigue—affording lower costs and higher receipts.



11-13

ELECTRIC

SALES OFFICES IN ALL LARGE CITIES

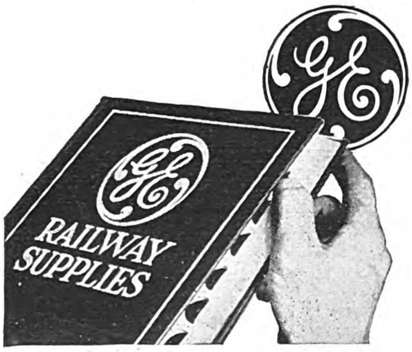
RENEWAL PARTS
FOR
CAR EQUIPMENT
GE
GENERAL

“Standardize on good material—then stick to it—by your book”

For years this has been our advice to those charged with the upkeep of railway equipment.

Why? Because only renewal parts of “original equipment quality” can keep G-E Car Equipment working at its best. And that is why General Electric has a double responsibility in building the utmost service into G-E Renewal Parts.

You select your equipment with care. Don't endanger its performance with repair parts selected at random.

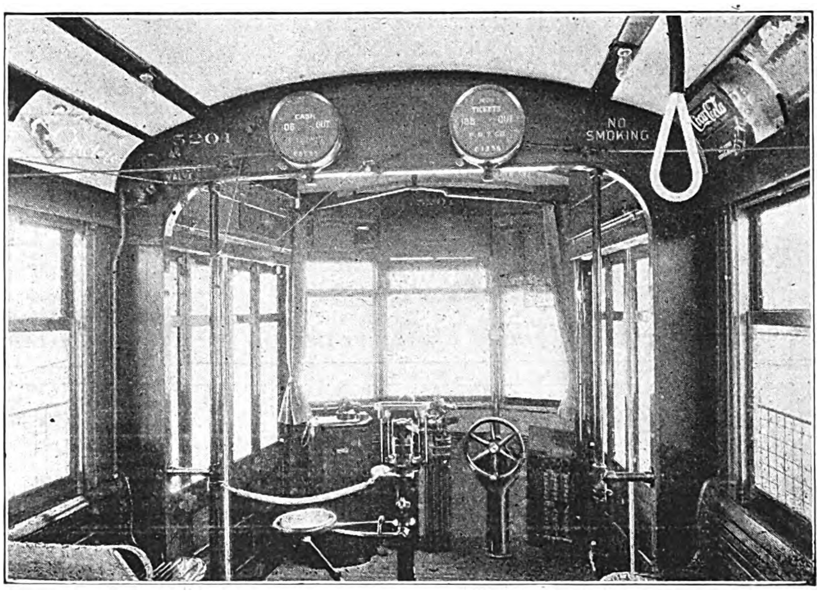


54C-13

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N.Y., SALES OFFICES IN ALL LARGE CITIES

The Supreme Test!



Peacock Staffless Brakes

No doubt all your cars are equipped with auxiliary hand brakes—How do they stand up? Will they stop the cars under the most adverse conditions? That's the test.

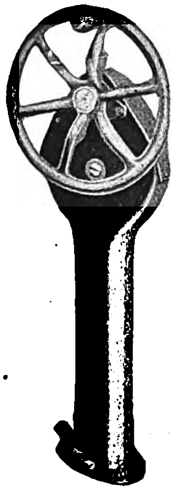
For more than twenty years Peacock Brakes have stood for the Supreme Test—a few swift turns of the hand wheel and the sure grip of the Peacock Brakes take hold with the maximum braking power—a retarding grip which is more effective than spinning wheels backward with reversed motors. The BRAKING POWER of the Peacock is at least three times as powerful as any ordinary type hand brake.

The significant fact that by far the largest percentage of all new cars are equipped with Peacock proves that they have stood the test of service.

Write today for full information

NATIONAL BRAKE COMPANY
890 Ellicott Square
Buffalo, N. Y.

The Peacock Staffless



Send for full details of this high-grade hand brake.

Bankers and Engineers

Ford, Bacon & Davis
Incorporated
Engineers
115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

STONE & WEBSTER
Incorporated
EXAMINATIONS REPORTS APPRAISALS
ON
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES
New York Boston Chicago

SANDERSON & PORTER
ENGINEERS
REPORTS, DESIGNS, CONSTRUCTION, MANAGEMENT
HYDRO-ELECTRIC DEVELOPMENTS
RAILWAY, LIGHT and POWER PROPERTIES
CHICAGO NEW YORK SAN FRANCISCO

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

C. B. BUCHANAN President W. H. PRICE, JR. Sec'y-Treas. JOHN F. LAYNG Vice-President
BUCHANAN & LAYNG CORPORATION
Engineering and Management, Construction,
Financial Reports, Traffic Surveys
and Equipment Maintenance
BALTIMORE 825 Equitable Bldg. Phone: Hanover 2142 NEW YORK 49 Wall Street

HEMPHILL & WELLS
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
APPRAISALS
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
43 Cedar Street, New York City

WALTER JACKSON
Consultant on **Fares and Motor Buses**
The Weekly Pass—Differential Fares
Ride Selling
143 Crary Ave., Mt. Vernon, N. Y.

A. L. DRUM & COMPANY
Consulting and Constructing Engineers
VALUATION AND FINANCIAL REPORTS
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE COMMISSIONS
CONSTRUCTION AND MANAGEMENT OF ELECTRIC RAILWAYS
230 South Clark Street Chicago, Ill. 215 South Broad Street Philadelphia, Pa.

The J. G. White
Engineering Corporation
Engineers—Constructors
Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.
43 Exchange Place New York

THE BEELER ORGANIZATION
ENGINEERS AND CONSULTANTS
Traction - Traffic - Equipment - Power
COORDINATION OF SERVICE—IMPROVED OPERATIONS
INCREASED TRAFFIC—FINANCIAL REPORTS
APPRAISALS—MANAGEMENT
52 Vanderbilt Ave. New York City

ENGELHARDT W. HOLST
Consulting Engineer
Appraisals, Reports, Rates, Service Investigation, Studies on Financial and Physical Rehabilitation Reorganization, Operation, Management
683 Atlantic Ave., Boston, Mass.

JOE R. ONG
Consulting Transportation Engineer
Specializing in Traffic Problems and in Methods to Improve Service and Increase Efficiency of Operation
PIQUA, OHIO

DAY & ZIMMERMANN, INC.
ENGINEERS
DESIGN - CONSTRUCTION - REPORTS
VALUATIONS - MANAGEMENT
NEW YORK PHILADELPHIA CHICAGO

Byllesby
Engineering & Management
Corporation
231 S. La Salle Street, Chicago
New York Tacoma

JAMES T. SWAN CO.
(ESTABLISHED 1909)
CERTIFIED PUBLIC ACCOUNTANTS
NEW YORK —— MASS.
SPECIAL DEPARTMENT FOR ANALYSIS OF
TRANSPORTATION PROBLEMS, TRAFFIC, FARES, FINANCES
366 BROADWAY, NEW YORK

McCLELLAN & JUNKERSFELD
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 Trinity Place, New York
CHICAGO ST. LOUIS WASHINGTON

JAMES E. ALLISON & CO.
Consulting Engineers
Specializing in Utility Rate Cases and Reports to Bankers and Investors
1017 Olive St., St. Louis, Mo.

Business Research Corporation
formerly
Bureau of Commercial Economics, Inc.
Industrial Engineers
Organization—Methods—Facilities—Personnel
72 West Adams Street, Chicago

HUMAN ENGINEERING
Railway Audit and Inspection Company, Inc.
Franklin Trust Building, Philadelphia
BRANCHES: Boston, New Orleans, New York, Pittsburgh, Baltimore, Chicago, Atlanta, St. Louis

STEVENS & WOOD, INC.
Design and Construction of Power Stations
Railroad Electrification, Industrial Plants
REPORTS AND APPRAISALS
Management and Financing of Utilities and Industrials
Mahoning Bank Bldg.
Youngstown, O.
120 Broadway
New York

Transmission Line and Special Crossing Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG
ARCHBOLD-BRADY CO.
Engineers and Contractors
SYRACUSE, N. Y.

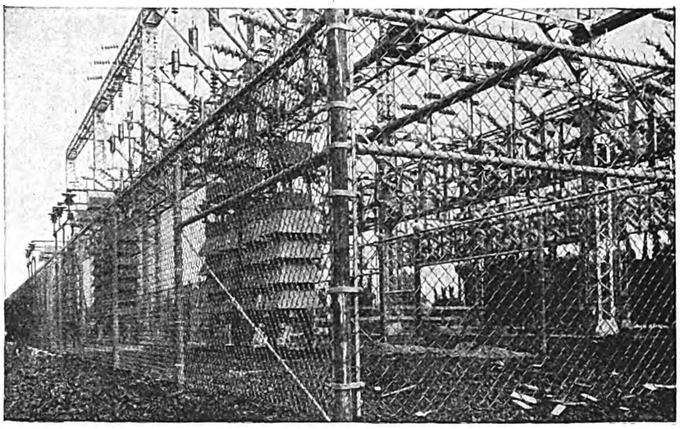
THE P. EDWARD WISH SERVICE
50 Church St.
NEW YORK
Street Railway Inspection
DETECTIVES
131 State St.
BOSTON

NORMAN Mc D. CRAWFORD
Public Utility, Financial, Engineering Operating Reports and Analyses
95-97 LIBERTY STREET, NEW YORK
Phone: Hanover 8344

KELKER, DeLEUW & CO.
CONSULTING ENGINEERS
REPORTS ON
Public Relations
Rates
Operating Problems
111 W. Washington Street, Chicago, Ill.

"Boyerized" Products Reduce Maintenance
Bemis Trucks
Case Hardened Brake Pins
Case Hardened Bushings
Case Hardened Nuts and Bolts
Manganese Brake Heads
Manganese Transom Plates
Manganese Body Bushings
Bronze Axle Bearings
Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.
Bemis Car Truck Co., Springfield, Mass.

Standardize on **PAGE**
substation *and* transformer protection—



—permanent, sightly,
and costs less—

You'll have all stations fenced alike which will simplify ordering and reduce erection costs. Removable Page panels, fitting into concrete set sleeves, make wide expensive gates unnecessary for replacement of transformers on other equipment.

Page Fence will last longer—it's the strongest type of woven fence made. Our galvanizing-after-weaving process produces a zinc coat practically 5 times heavier than on ordinary fence wire. And it's easy to erect—experienced crews will do this for you—or we can supply trained foremen to direct your own labor.

Send for Book on Substation Fencing

This will show you how others are saving money for standardizing on Page—what types of fence are used—how Page conforms to uneven ground. Mail the coupon for a copy—it's free.

PAGE FENCE & WIRE PRODUCTS ASS'N
215 N. Michigan Avenue, Dept. 56, Chicago, Ill.

ACCO
AN ASSOCIATE COMPANY OF AMERICAN CHAIN COMPANY, Inc. in business for your safety

Distributing wire link products made by the Page Steel & Wire Co., Bridgeport, Conn., an associate company of the American Chain Co., Bridgeport, Conn.

District Offices:
San Francisco Chicago Pittsburgh
New York

STEEL AND WIRE PAGE QUALITY PRODUCTS

PAGE PROTECTION FENCE

Page Fence & Wire Products Assn.,
215 N. Michigan Ave., Dept. 56,
Chicago, Ill.

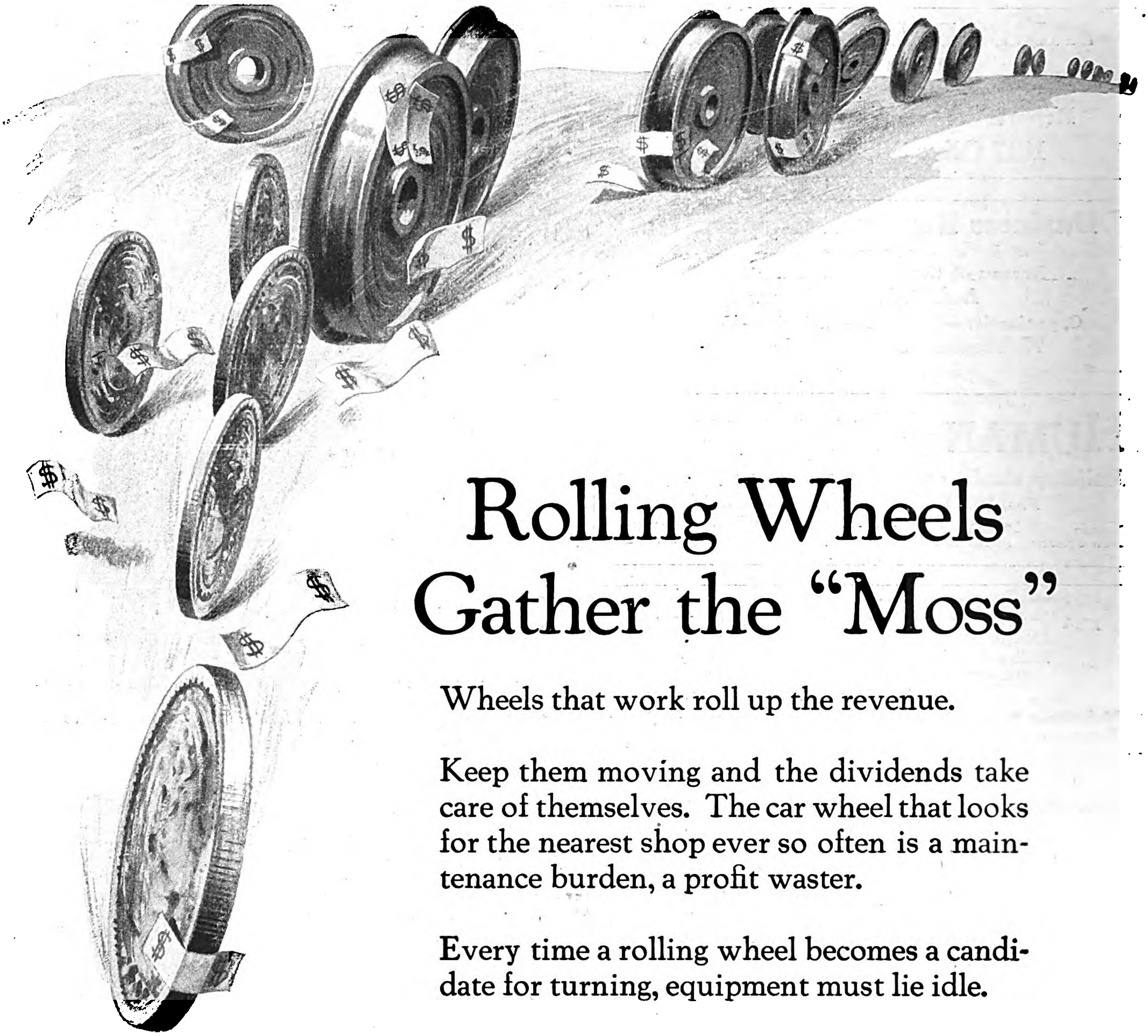
Gentlemen:
Please send me your free book on PAGE Substation Fencing and other data of interest.

Firm...

Individual Inquiring...

Address...

....



Rolling Wheels Gather the "Moss"

Wheels that work roll up the revenue.

Keep them moving and the dividends take care of themselves. The car wheel that looks for the nearest shop ever so often is a maintenance burden, a profit waster.

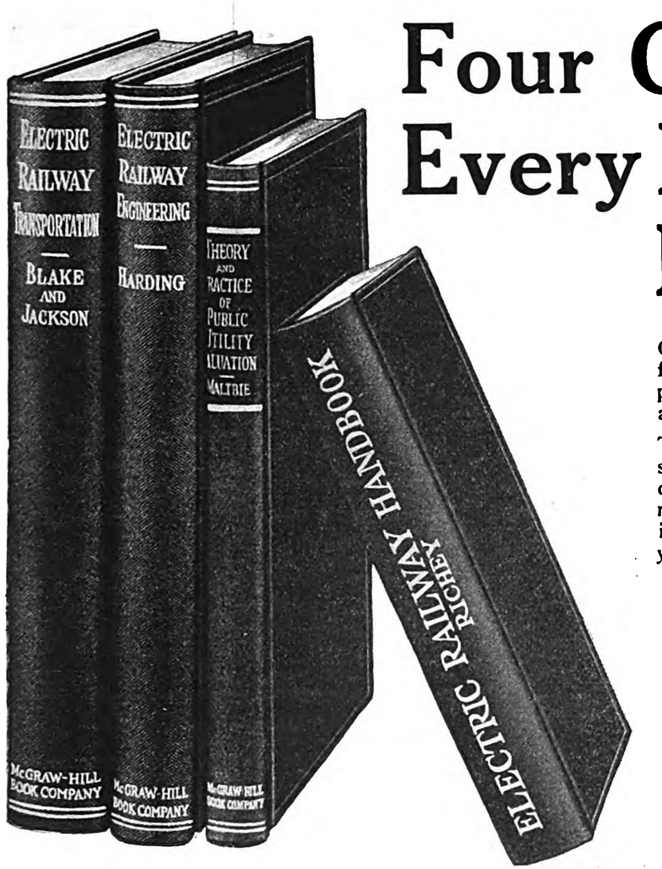
Every time a rolling wheel becomes a candidate for turning, equipment must lie idle.

This waste of good equipment can be stopped by using Davis "One Wear" Steel Wheels. These give equal strength, more mileage and stay in service during their entire life.

Ask us to show you why the Davis "One Wear" Steel Wheel is the logical solution to that wheel problem.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO **ST. LOUIS**


ELECTRIC RAILWAY TRANSPORTATION
BLAKE AND JACKSON
McGRAW-HILL BOOK COMPANY
ELECTRIC RAILWAY ENGINEERING
HARDING
McGRAW-HILL BOOK COMPANY
THEORY AND PRACTICE OF PUBLIC UTILITY VALUATION
MALTBIE
McGRAW-HILL BOOK COMPANY
ELECTRIC RAILWAY HANDBOOK
RICHEY

Four Great Books Every Electric Railway Executive Needs

Out of the thousands of books published for each field of industry, four or five (often more) usually stand out as those with which the particular industry's executives should be familiar—should know—and should use.

THE ELECTRIC RAILWAY LIBRARY is just that kind of a selection for the electric railway executive. These books cover construction, operation, maintenance, and so forth. They give modern, reliable information derived directly from practice which in one way or another and at one time or another enters into your work.

Electric railway executives by their general purchase of these four books have stamped them as being without doubt four books every railway executive needs.

Here they are for you in special library combination—on a free examination offer—on a special monthly payment plan.

Free examination
no money down
small-monthly payments

THE NEW

Electric Railway Library

4 volumes, 1851 pages, well illustrated
$15.00 postpaid, payable in four installments

These four books give the latest reliable electric railway information you need, derived from the actual experience of practical electric railway engineering men. The library contains no far-fetched suggestions—practical usefulness is its keynote. It points out ways and means of increasing efficiency and lowering costs which other engineers have found successful. You can apply these methods to your every-day problems. You can make this information count for you in actual dollars and cents of better results. The library will more than pay for itself. It is a set of four books every electric railway company should have.

Close to 2000 pages of authoritative data

Blake and Jackson's ELECTRIC RAILWAY TRANSPORTATION takes up problems of getting the cars over the tracks, increasing traffic, collecting fares, etc. It has much valuable information on the motor bus. It is right up to the minute in its new second edition.

Harding's ELECTRIC RAILWAY ENGINEERING covers train operation, power generation and distribution, equipment and types of systems. It is a thorough book on the broader engineering problems.

Practical and usable information you need

Maltbie's THEORY AND PRACTICE OF PUBLIC UTILITY VALUATION discusses the principal points in the valuation of public utilities—clearly, thoroughly and usably. Invaluable information on recognized evidences of value, easements, reproduction cost, overhead, going value, contract value, depreciation, and the like. Discusses basic economic principles and the existing conditions which together lead the way to proper valuation.

Mail this free-trial coupon

The complete electric railway reference

Richey's ELECTRIC RAILWAY HANDBOOK—The well known Richey—is a pocket encyclopedia of electric railway construction, operation and maintenance. It is the Webster of the industry, bigger and better than ever in its new second edition.

Examine the set for 10 days FREE

No obligation to purchase—no agents—no red tape. The books are yours to keep or return as your own judgment dictates. We believe you'll be glad to have these books. Examine a set and see.

McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.
370 Seventh Ave., New York

Send me the NEW ELECTRIC RAILWAY LIBRARY for my inspection. If the books prove satisfactory, I will send $3.00 in ten days and $4.00 per month for three months—until I have paid the price of the books—$15.00. If the books are not what I want, I agree to return them postpaid within ten days of receipt.

Name ....

Address ....

Position ....

Company ....

(Books sent on approval to retail purchasers in the U. S. Canada only.)

E 6-27-25

What a European Manager Thinks of a New American Book

If this book is so valuable to a leading foreign manager whose practice is so different, it should be even more valuable to the American electric railway operator.

The following excerpts are from a signed review of the new edition of Blake and Jackson's "Electric Railway Transportation". It was contributed by Mr. William Stein, Regierungsbaumeister a. D., and managing director of the Hamburg Elevated Railway. It was published in the issue of "Verkehrstechnik" for May 22, 1925.

"The first edition of this book appeared in 1917 but hardly became known in Europe because of the war. The new edition deserves special attention because it offers a book which is unique of its kind. There are many books in which the technical features of the operation of electric railways are considered. Here is one which is concerned directly with the business of transportation itself—namely the experience and science of the operating manager. The material is treated from many sides but so thoroughly and skillfully that the book may well be called a model in the combination of useful facts.

"Naturally, the discussions of electric railway operation are treated primarily from the American standpoint. Nevertheless, there are references to European experience, though not in extenso. Whoever wants to learn about American railway practice and whoever realizes that the conditions as they exist over there, prevail to a greater or less extent also on this side of the ocean, ought to study this book thoroughly.

"The first subject considered is the organization of the transportation department or the relations between the various transportation officers and their functions, as developed on small and large systems. The authors especially emphasize the need for close relations between the transportation department and those connected with the technical side of the service. In this connection, the reader will learn that the American Electric Railway Association has compiled an extensive list of technical terms connected with electric railway operation and has carefully defined them, so that throughout the country the same terms have the same meanings in all circumstances. For example, zone systems are classified in four divisions, while here we recognize only one, although we have like varieties.

"Further on, there is a discussion of the methods of checking and tabulating traffic statistics, this section being aided by many significant data, diagrams and illustrations which are explanatory of the noteworthy methods employed. Since the traffic in American cities has greater hourly fluctuations than are customary in Europe and since there is need of providing skilfully for this traffic, such as from great plants like the Ford Motor Works, especial attention has to be paid to any means that will modify the peaks. Further on, in the discussion on fares, the matter of flat fares and various forms commutation tickets and passes is considered. An American Zone fare practice worth attention is that of issuing zone checks on pay-leave operation.

"The most valuable part of the book, however, is that in which new types of cars and the methods of collecting fares are discussed. While these are entirely different from those in Europe, they have been developed to great efficiency. These two matters—the collection of fares and the design of cars—are closely related, because the conductor remains in a definite place where he can undertake any duties that are likely to arise in operation. These different conditions including one-man operation, have never been set forth so comprehensively and so clearly as in the book mentioned. A study of this chapter is, therefore, very much worth while.

"The courteous handling of the passengers on the car, destination signs, publicity and schedules are also well treated as is also the question of the relation between the street railway and the bus. The field of the bus is seen to be much the same as with us. One peculiarity of the American car-bus problem, however, is the large number and extent of low traffic density interurbans. Some of these lines have actually been taken up and their services replaced by the motor-bus.

"The reader can also learn much about the handling of the personnel, which differs widely from our practices. For example, rotation of runs among the men operating from a depot is rare, the usual practice being to assign the runs to the same men regularly on a seniority basis. Much information is also given in this connection on methods of discipline, mutual benefit associations and employee welfare work—in all of which the practice differs notably from that in Europe.

"All in all, the book contains so much that is very worth while that there should be a copy in the library of every street railway system."

This book was written by Henry W. Blake, senior editor *Electric Railway Journal*, and Walter Jackson, fare and bus consultant. It is a complete guide to the best modern electric railway transportation practice. It contains 437 pages and 121 illustrations. The price of the book alone is $5.00.

Special Combination Offer, Good for New or Renewal Subscriptions, of $7.00.

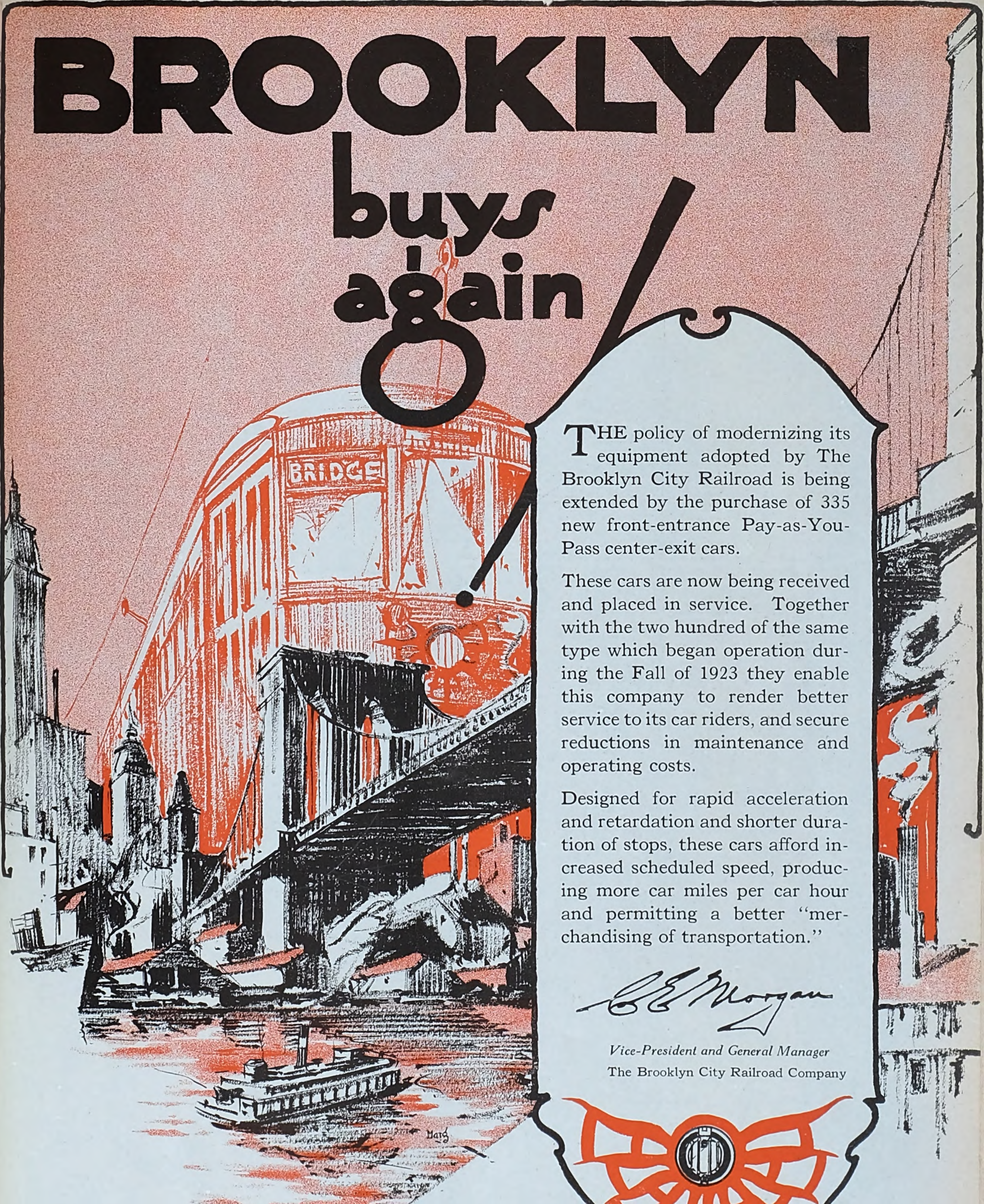
	Retail Price
Blake & Jackson's "Electric Railway Transportation"	$5.00
"Electric Railway Journal" for one year...............	$4.00
	$9.00 for $7.00

You save $2.00 by ordering them together

Address Subscription Department

ELECTRIC RAILWAY JOURNAL, Tenth Ave. at 36th St., New York

BROOKLYN buys again!



THE policy of modernizing its equipment adopted by The Brooklyn City Railroad is being extended by the purchase of 335 new front-entrance Pay-as-You-Pass center-exit cars.

These cars are now being received and placed in service. Together with the two hundred of the same type which began operation during the Fall of 1923 they enable this company to render better service to its car riders, and secure reductions in maintenance and operating costs.

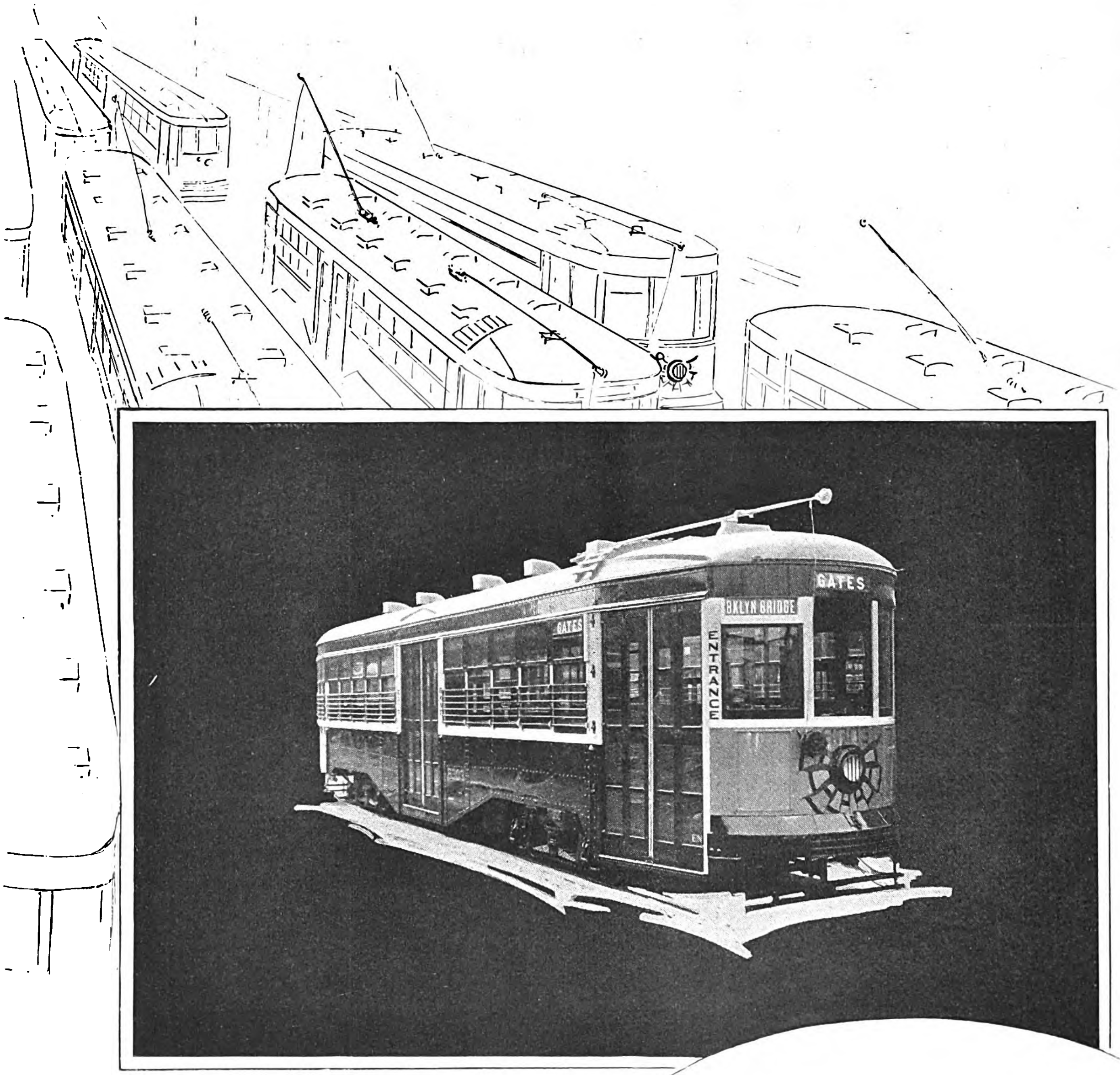
Designed for rapid acceleration and retardation and shorter duration of stops, these cars afford increased scheduled speed, producing more car miles per car hour and permitting a better "merchandising of transportation."

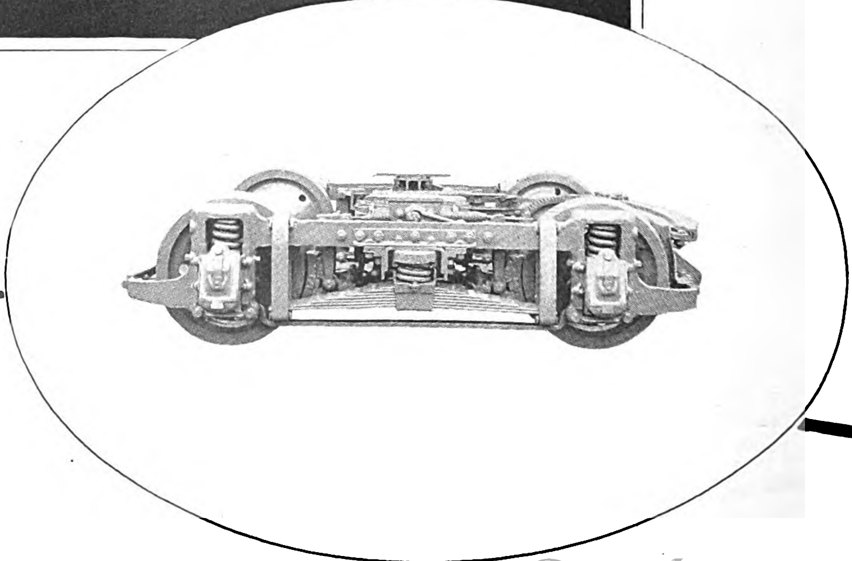
C. E. Morgan

Vice-President and General Manager
The Brooklyn City Railroad Company

Modern Cars Build Busine

Leader


GATES
BKLYN BRIDGE
GATES
ENTRANCE



150 Cars
620 Trucks
"BRILL"

for Brooklyn City Railway

amongst leaders!

BRILL CARS

and Trucks

for the Brooklyn
City Railroad~

Brill Cars and Trucks have been the choice of the foremost electric railways for years.

Once again! when the Brooklyn City Railway placed its order for 150 cars and 620 trucks with The J. G. Brill Company, Brill-built cars and trucks justified their reputation gained thru years of service.

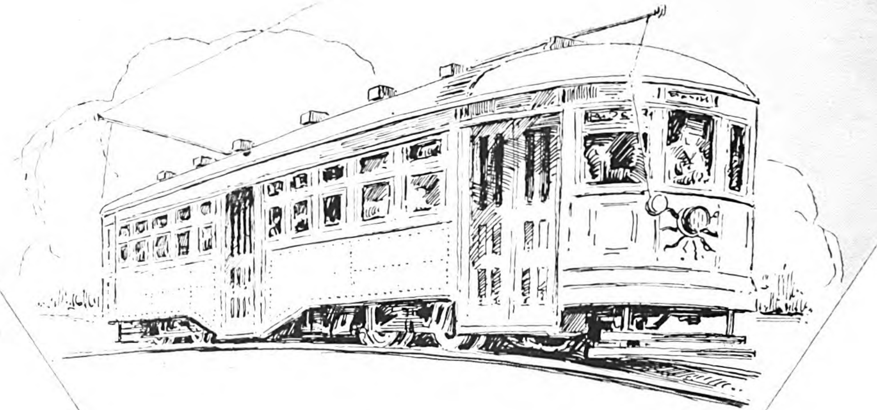
THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MANF'G CO.
ST. LOUIS MO. CLEVELAND, OHIO. SPRINGFIELD, MASS.

BRILL

Sure-fire Safety—at least upkeep cost

On all of Brooklyn City's new cars, Root Steel Spring Life Guards are a standard specification.



FOUR sound reasons stand back of Brooklyn's choice. They are well worth your careful consideration.

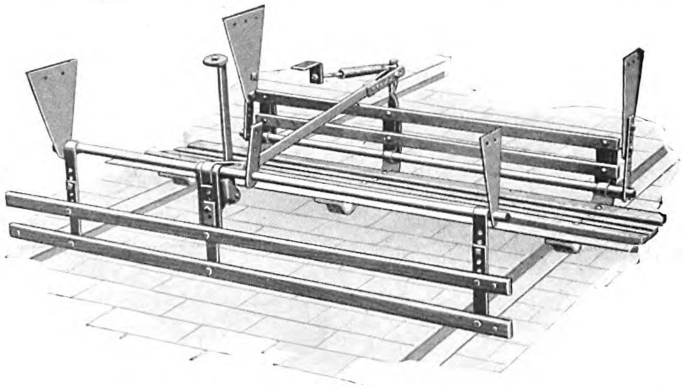
(1) The Root Spring Life Guard is essentially simple and easy of installation.

(2) Having no intricate mechanisms, and being made of the highest grade materials, in weights and sections amply large for the service, upkeep is practically negligible.

(3) It cannot possibly slip down accidentally, and when down can be reset by the motorman from his platform.

(4) It is all that the name signifies—A LIFE GUARD. No object can get through or under the guard when down.

Write us for further details of this and other Root Spring Specialties.

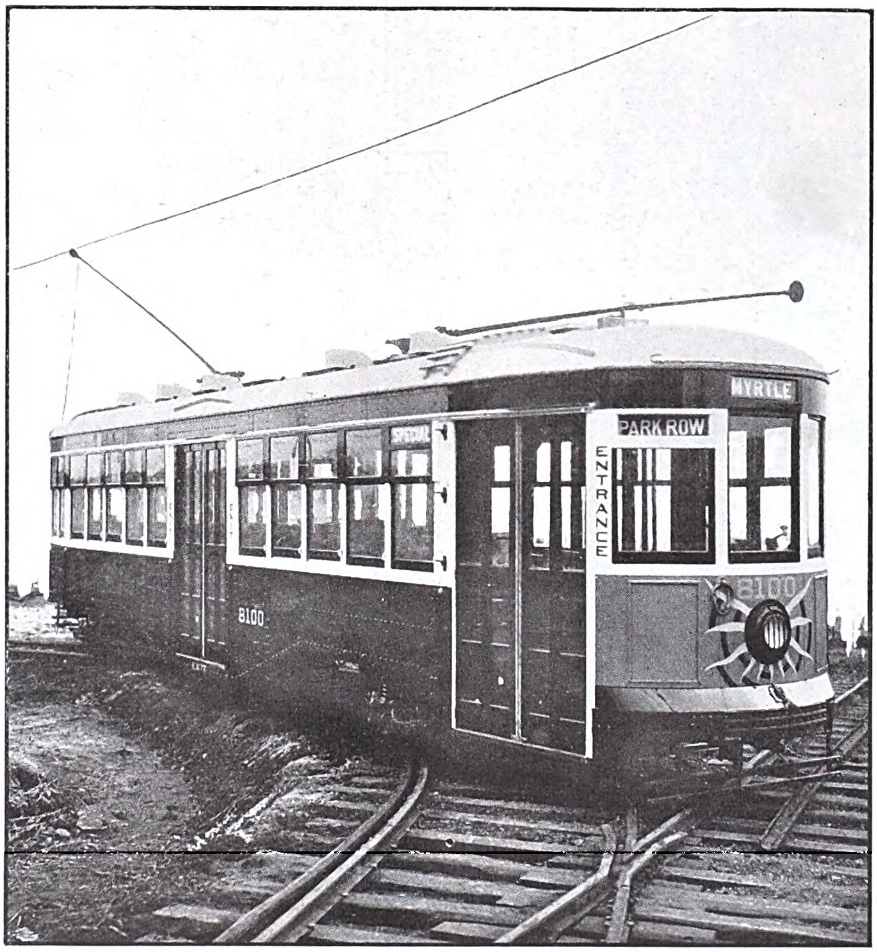


The ROOT STEEL SPRING LIFE GUARD

Root Spring Scraper Co.
Kalamazoo, Mich.

Earn Greater Net Revenue in Brooklyn

100 more "Quality" Cars for Brooklyn

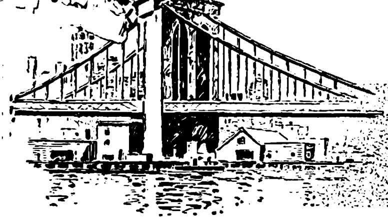


A repeat order for the cars
And a repeat for St. Louis seats

St. Louis Car Co.'s Latest Improved Equalized
E. D. J.-64 Trucks
Ordered For Twenty Five Of These Cars

Two years ago the first hundred "Quality" cars were shipped to the Brooklyn City R.R. Their performance and stand-up qualities earned them that recognition which brought the order for the second hundred now. *"Quality" tells.*

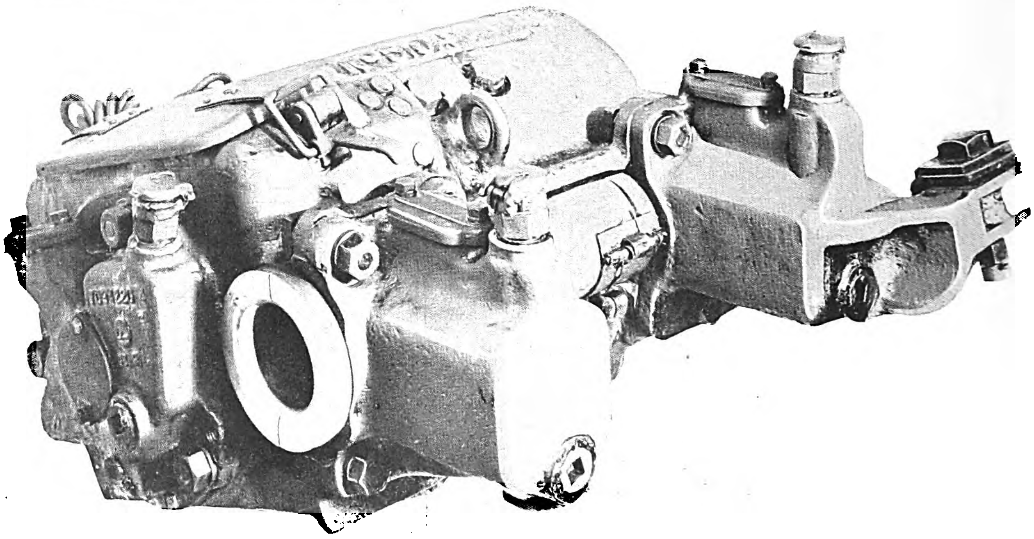
St. Louis Car Company
St. Louis, Mo.



Shorter Running Time with Modern C

Motors!
Westinghouse 510-A's
(4 per car)

Away!



For *all* these latest cars!

Judged from the standpoint of experience—in operation and maintenance—Westinghouse motors have successfully met the exacting requirements in Brooklyn.

Westinghouse No. 510 A motors, being especially adapted for modern city service, where high acceleration plus fast free-running speed is essential, have been selected for all the 335 additional new cars.

WESTINGHOUSE
ELECTRIC

MEMBER
AERA
1925

— Ahead of all the other traffic !

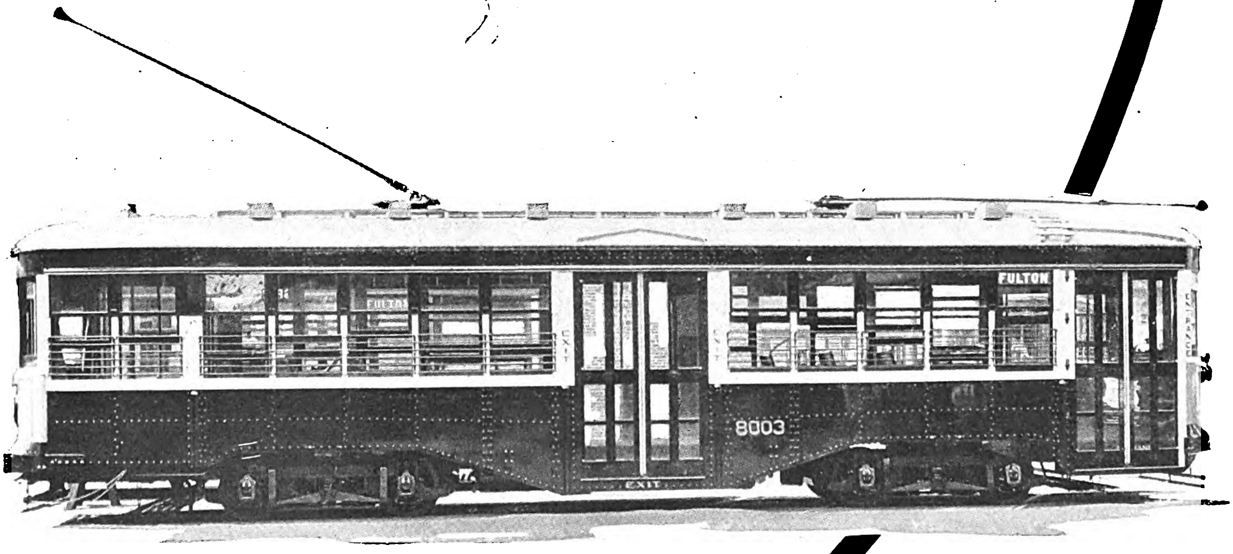
The street car leads in Brooklyn by superior speed and acceleration

Automobiles, taxis, trucks — they all *trail* these whizzing cars that the Brooklyn City Railroad uses. They simply can't get by 'em on the runs from corner to corner. Faster in accelerating, these cars also reach and maintain a speed between stops that frustrates even the wildest of taxi-men.

Running times have been reduced by several minutes and the leadership of the street car as the basic means of urban transportation has been re-established.

More and better-satisfied patrons, increased revenue and decreased expenses — these have been the fruits of the first 200 cars, fruits which have led the management to order 335 more,— all Westinghouse-equipped.

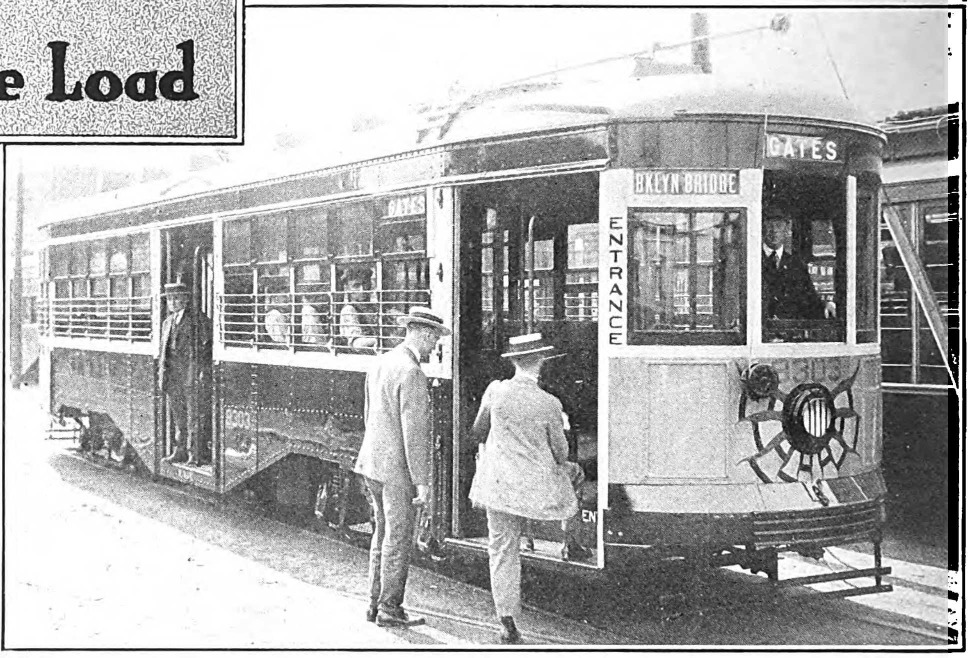
Are there similar possibilities on your road? Let our engineers assist you in the investigation.



Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Quick Getaway and Effective Brak

BRAKES!
✓ Variable Load



Speeding Up City Traffic

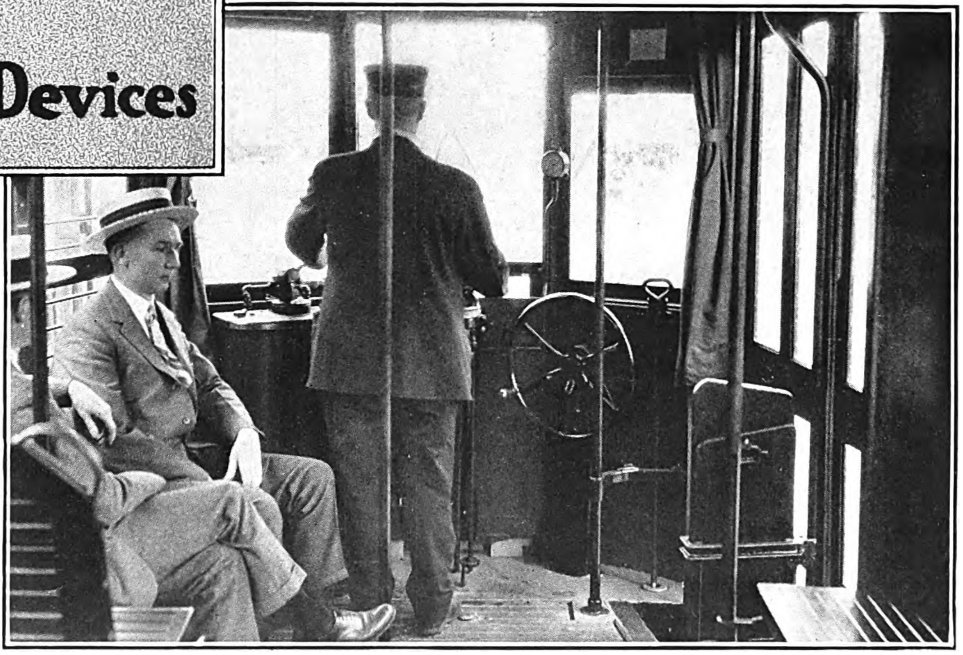
EVEN fractions of a second count in shortening runs like those in Brooklyn where stops are frequent. The Variable Load Brake provides a retarding force which automatically adjusts itself to the car loading so that stopping distances are uniform. This reduces the average time consumed in stopping and cuts down the running time between stops, by permitting longer peak-speed operation. A general speeding up of service is the result.

Westinghouse Variable Load Brakes "made good" on the first 200 Brooklyn cars, and they are being used on the new cars, making a total of 535 equipments. All of these cars have DH-16 Compressors—the well-known Bungalow type.

Westinghouse Traction Brake Co.
General Office and Works, Wilmerding, Pa.

Control!

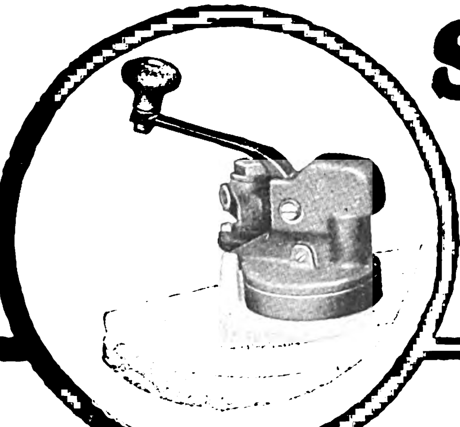
Safety Car Devices



Safeguarding City Traffic

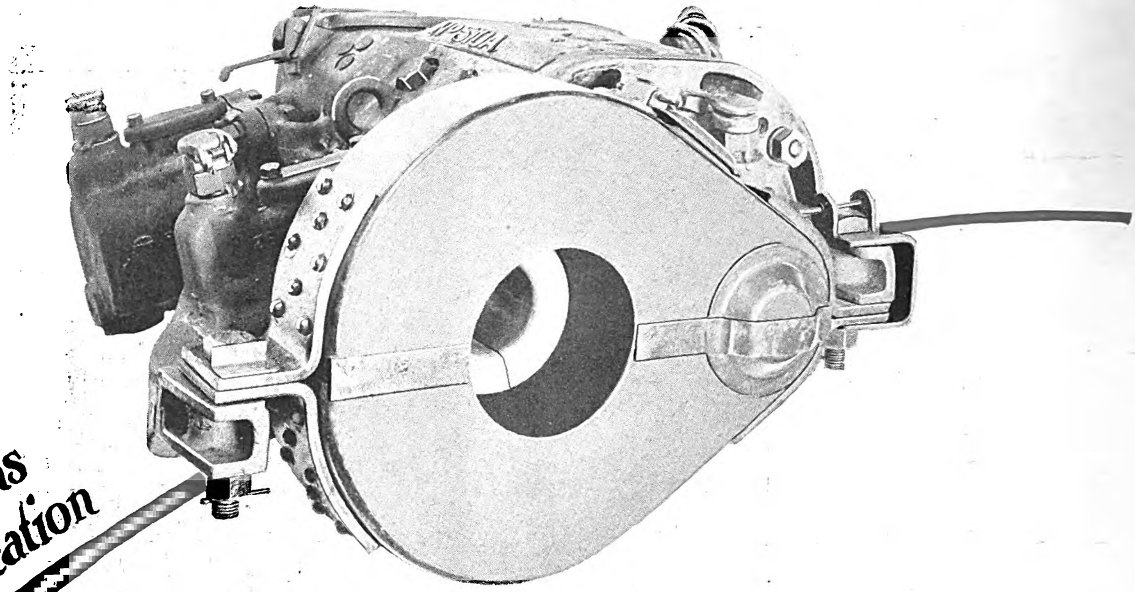
INTERLOCKING of car control, brakes, doors and steps, by means of the Safety Car Control Equipment, prevents door opening before the stop is completed, and likewise prevents a start before the doors are closed. This feature also causes automatic cutting off of current and emergency brake application if the operator releases the controller handle through carelessness or disability.

Brooklyn tried out the Safety Car Devices on the first 200 cars with entire satisfaction, and they are being used on the 335 new cars. Over 400 other traction properties are realizing the benefits derived from using Safety Car Control Equipments.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

For lightness—strength—low maintenance



Brooklyn's Specification

1340

Chillingworth

Drawn Steel Seamless

Gear Cases

Applied to W. H. 510 A Motors

To start with—The price and weight of this Gear Case are less than Malleable Iron, and stronger than built-up steel cases.

Then again—Tough, flexible drawn steel is not so liable to serious breakage,—gives your gears utmost protection.

Repairs are less expensive because seamless steel is more easily welded and riveted than iron.

The one-piece construction of Chillingworth Gear Cases with *overlapping* joint between the two halves absolutely prevents the entry of dust or the escape of grease. There are no seams to open up.

Expensive gears are entitled to this 100% protection for utmost economy in operation.

Chillingworth Manufacturing Co.
JERSEY CITY, N. J.

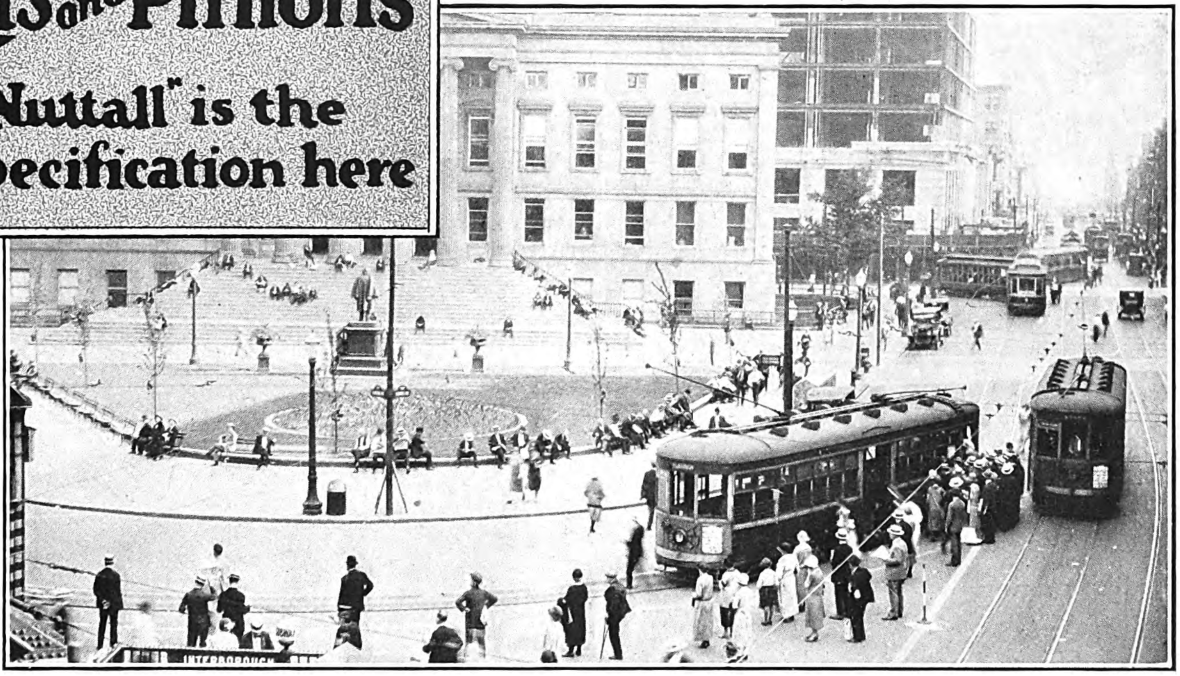
Sold in Canada by
RAILWAY & POWER ENG. CORP.
Toronto Montreal Winnipeg

Representatives:
H. F. KEEGAN & Co., Chicago
J. W. GERKE, New York

Sold in England by
CROYDEN ENG. CORP.
Croyden

Gears and Pinions

"Nuttall" is the specification here



Drive 'em!

Off with a flying start — whizzing to the next corner — stop 'em, start 'em, drive 'em — that's the way they beat the autos!

Underneath the car, where the driving is done — what's there, to stand this gaff?

"Nuttall" BP gears and pinions! Naturally they're "Nuttall", because that's where railway men turn for "tough-hard", quiet-running gears.

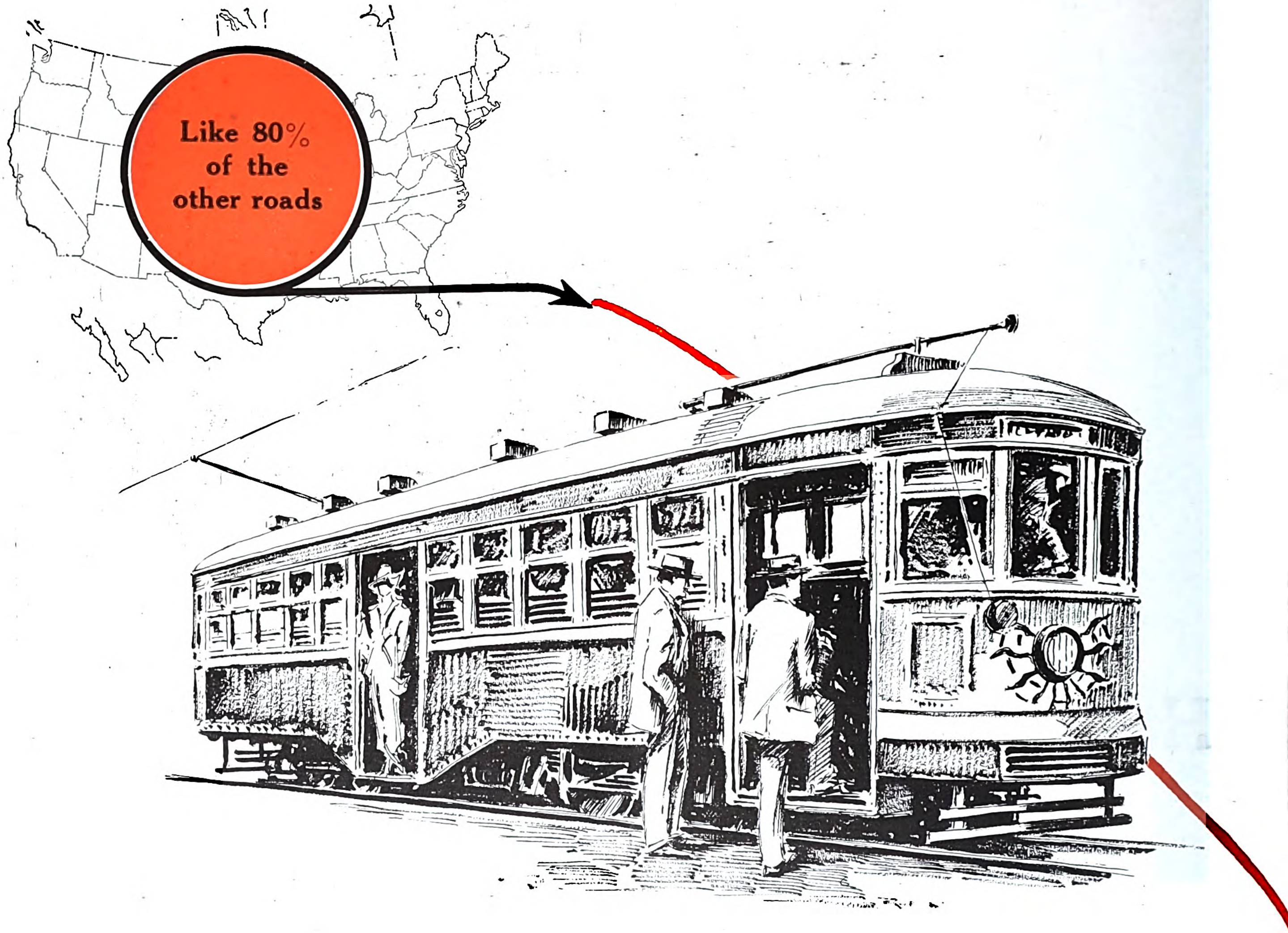
R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION

Nuttall

Modern Cars Build Business

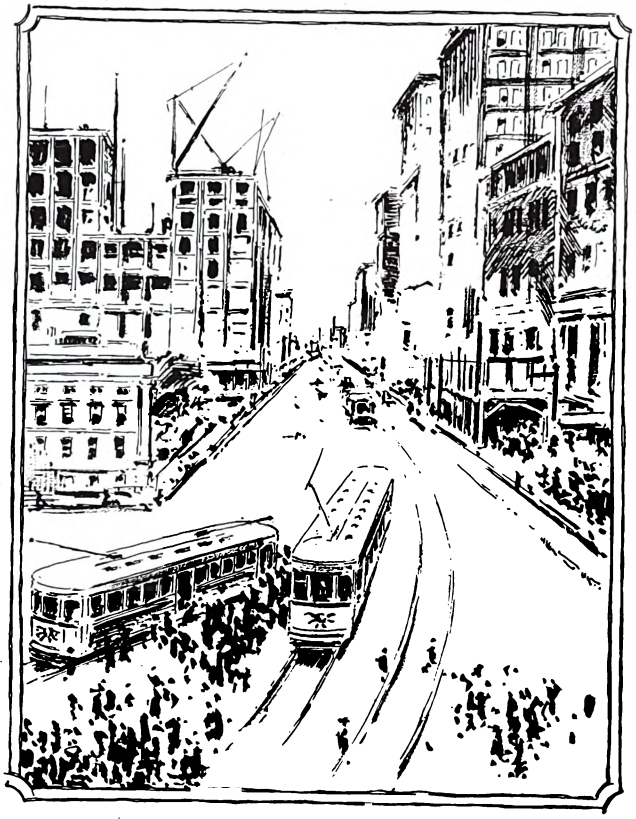


150 of these new cars are equipped with National Pneumatic door control

Go through the specifications of practically any new car order and you'll find that they call for National Pneumatic Door and Step Operating equipment.

NATIONAL

for Brooklyn City Railway



Handling Brooklyn crowds with speed

No other method for the operation of doors and steps can compare with the pneumatic engine on the score of speed with simplicity and absolute safety. Opening and closing is *cushioned;* there is no danger even to a small child; there is no slamming and banging to cause rapid deterioration of door frames and parts.

NATIONAL PNEUMATIC COMPANY

***Executive Office,* 50 Church Street, New York**
***General Works,* Rahway, New Jersey**

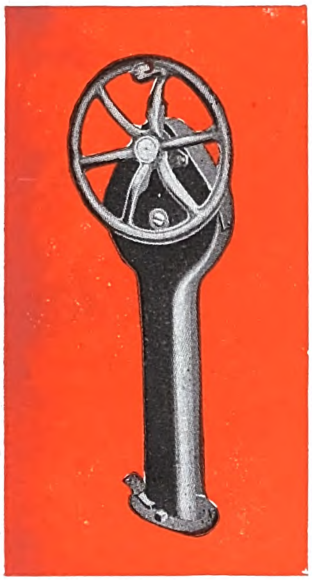
CHICAGO	MANUFACTURER IN	PHILADELPHIA
McCormick Building	TORONTO, CANADA	Colonial Trust Building

Dominion Wheel & Foundries, Ltd.

NP

PNEUMATIC

Quick Getaway and Effective Braking



PEACOCK STAFFLESS BRAKES

Installed and Used on Brooklyn's Cars

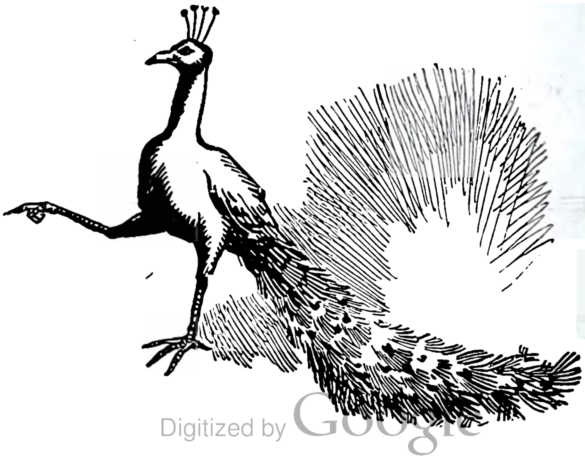
NOT merely "installed", as emergency equipment, but used every day, every trip by every operator. It's part of the rigid safety policy on The Brooklyn City Railroad, to insure that hand brakes are always in working order, and that men know how to use them effectively.

And just as Peacock Staffless Brakes have been the choice in the past, they are included on these latest cars as a matter of course. Emphatically—they've made good!

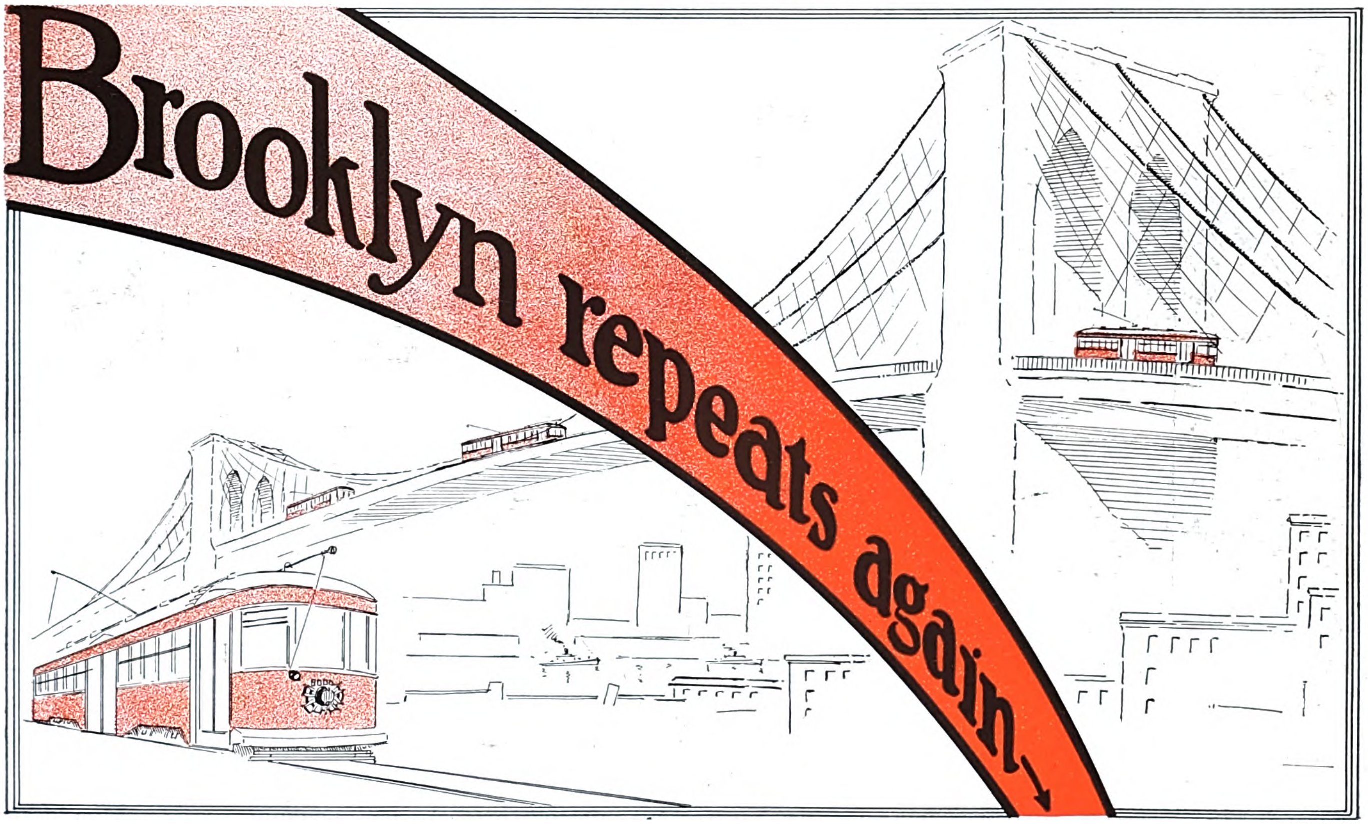
National Brake Co., Inc.
890 Ellicott Sq., Buffalo, N. Y.

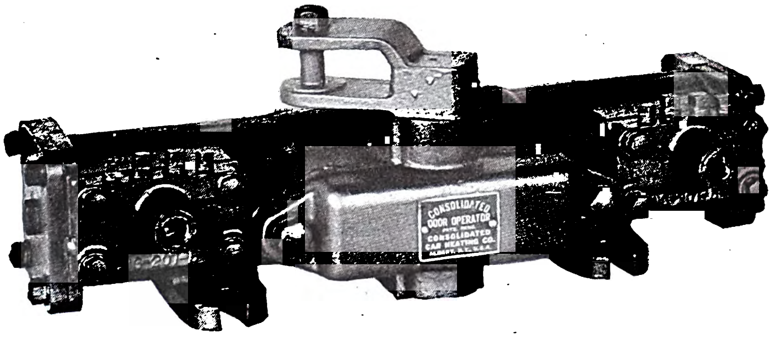
Canadian Representative
Lyman Tube & Supply Company, Limited, Montreal, Canada

Here it is!



Beat Automotive Traffic in Brooklyn





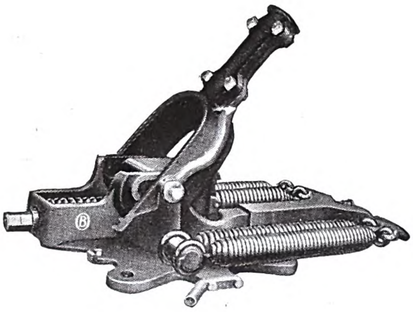
CONSOLIDATED DOOR ENGINES

For 200 new cars in 1923
For 185 new cars in 1925

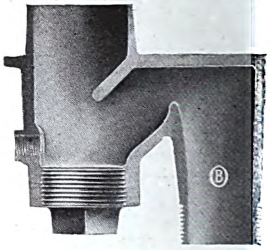
Consolidated Door Engines have firmly established their place as a factor in the electric railway field. They give such satisfactory service and need such slight maintenance that repeat orders come naturally.

CONSOLIDATED CAR-HEATING COMPANY
New York
Albany
Chicago

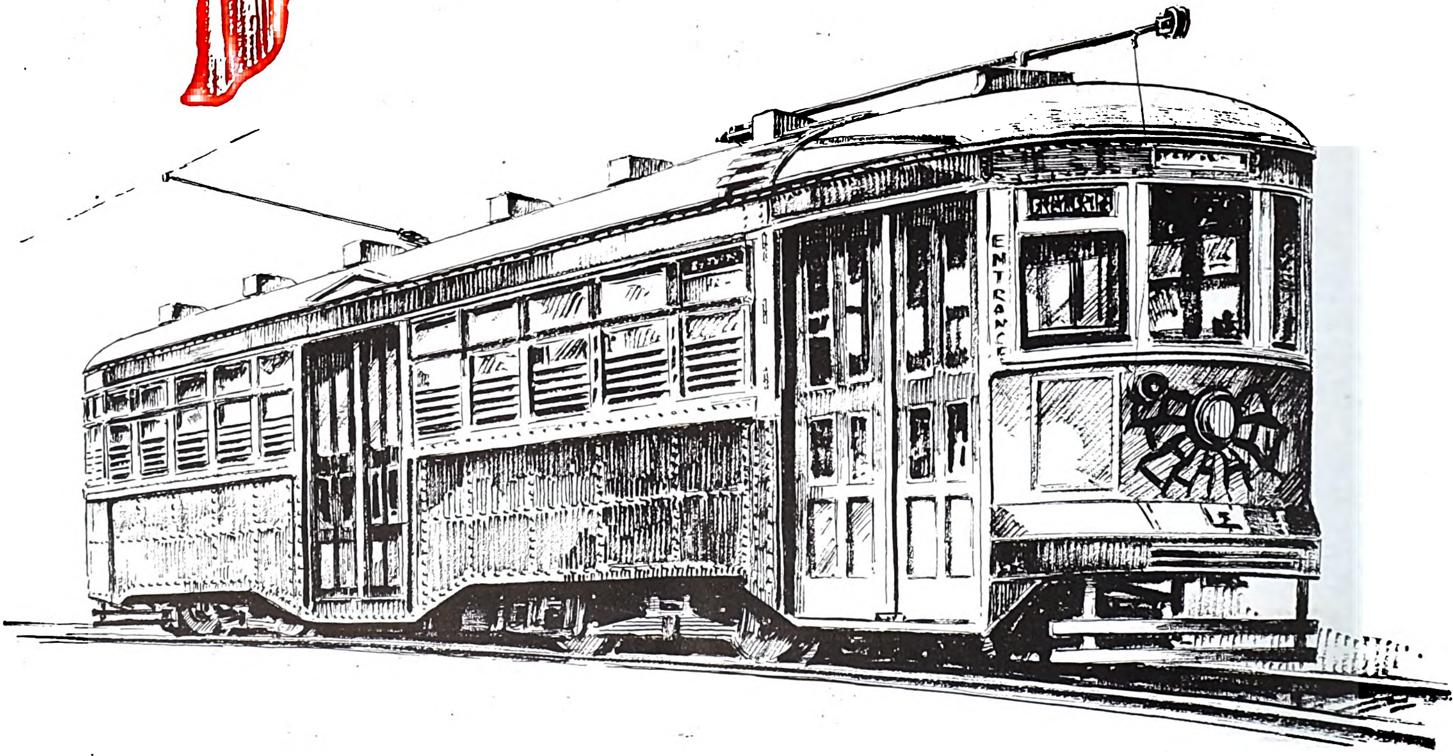
OB Products



O-B
Trolley Bases



O-B
Sand Traps

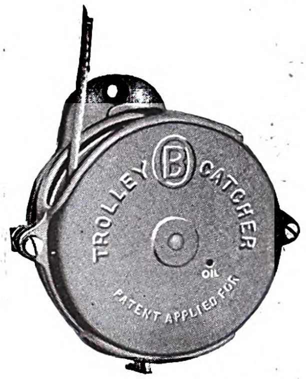


Provides Passenger Comfort and Safety

The high spots of operating efficiency on Brooklyn's new cars

HINDS
PATENTED

Imperial Headlights



Improved O-B Self Oiling
Trolley Catchers

In the execution of Brooklyn City Railroad's order each manufacturer has given of his best in the effort to produce street railway cars worthy of modern standards.

We are proud to have contributed the above mentioned standard O-B Specialties, as we believe, the best and most efficient that present day practice can afford.

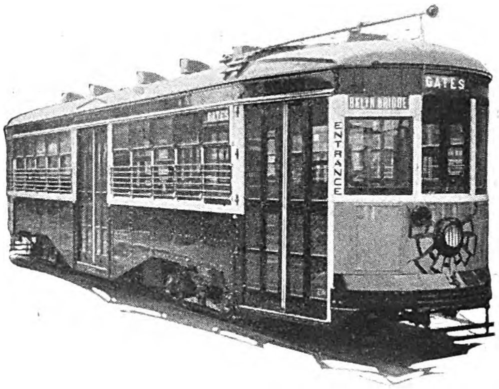
The Ohio Brass Co.
Mansfield, Ohio, U.S.A.

TROLLEY MATERIAL — ELECTRIC RAILWAY CAR EQUIPMENT — RAIL BONDS — HIGH TENSION PORCELAIN INSULATORS — THIRD RAIL INSULATORS

NEW YORK — PHILADELPHIA — PITTSBURGH
CHICAGO — CHARLESTON, W. VA.
LOS ANGELES — SAN FRANCISCO — PARIS, FRANCE

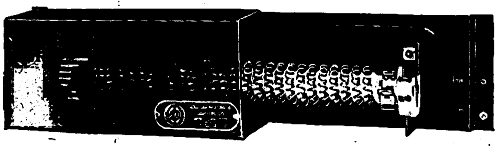
Dominion Insulator & Mfg. Co., Limited Niagara Falls, Ontario, Canada

More Gold Car Heaters for Brooklyn



8040 more to be exact!

6030 Truss Plank
1340 Panel
670 Vestibule



No. 478E Truss Plank

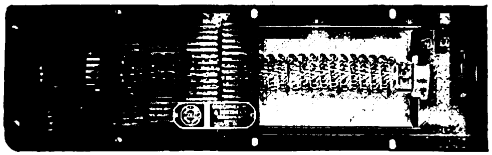
About eighteen months ago, when the first 300 of The Brooklyn City R.R.'s new cars were placed on the tracks, 4800 Gold Car Heaters went into service to keep Brooklyn car riders comfortable.

Now comes Brooklyn's second big order, with Gold Car Heaters again on the specification sheets.

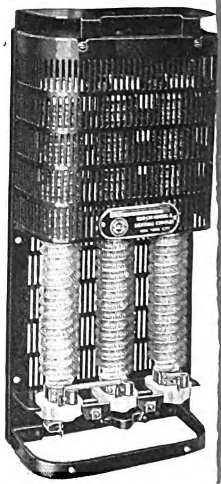
And when such an experienced and successful operating company as The Brooklyn City Railroad "comes back for more" it is mighty strong evidence of proved successful operation of Gold's Electric Heaters with their Low Cost of Installation, Ease of Inspection, Ease of Repairs, if necessary, which spells ECONOMY and the Proper Material for Coils, which is the heart of an Electric Heater, spells EFFICIENCY.

Nor is Brooklyn City alone in the choice. Gold's Electric Heaters have been consistently specified by many other famous electric railway systems and steam railroads using electric heating.

We manufacture all types of heaters and thermostatic control adapted for every class of railway service, from trackless trolley to railroad car; also for waiting rooms, etc. Write us.



No. 414E Panel

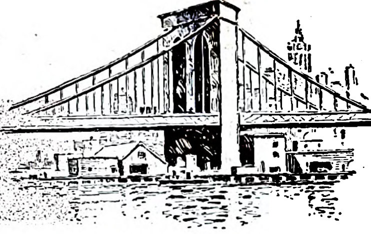


No. 470E
Vestibule

GOLD CAR HEATING
& LIGHTING CO.
Bush Terminal
220-36th St., Brooklyn, N. Y.

All Coil Supports
Interchangeable

Save Energy in Brooklyn



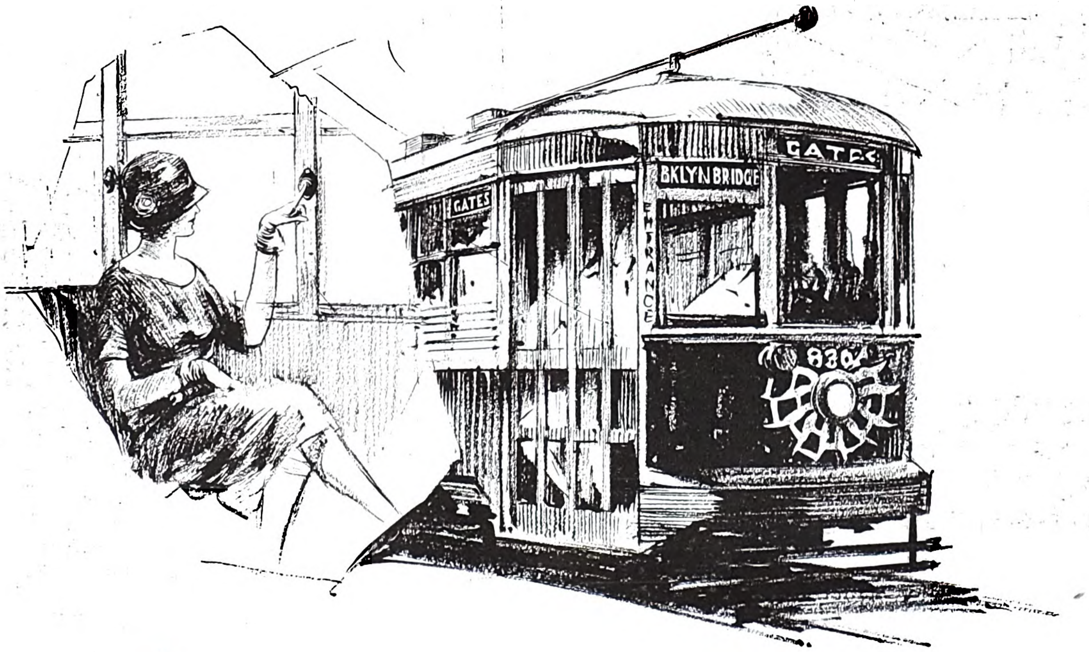
Keystone

written on the record of Brooklyn's revenue-building trolley cars

Get more patrons— and keep 'em satisfied

That's the principle on which the Brooklyn City Railroad is being made a public utility in the truest sense—and incidentally a financially successful traction system.

Plenty of conspicuous route and destination signs, and also a practical, always-on-the-job passenger signal system are two of the outstanding equipment details which materially aid in attracting traffic patronage, and holding it.



- ✓ ***FARADAY SIGNAL SYSTEMS***
- ✓ ***INTERNATIONAL FARE REGISTERS***
- ✓ ***HUNTER DESTINATION SIGNS***

ELECTRIC SERVICE SUPPLIES Co.

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

PITTSBURGH
839 Oliver Building

BOSTON
88 Broad St.

SCRANTON
316 N. Washington Ave.

DETROIT
General Motors Building

Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

Attractiveness, Speed and Economy

Fine new cars—and sure

TEX

LUBRICATION

TEXACO

THE TEXAS COMPANY, U. S. A.
Texaco Petroleum Products

Earn Greater Net Revenue in Brooklyn

of a good start with

ACO

SERVICE

FOR years the Brooklyn City Railroad and all of the B. M.T. lines have been TEXACO Serviced.

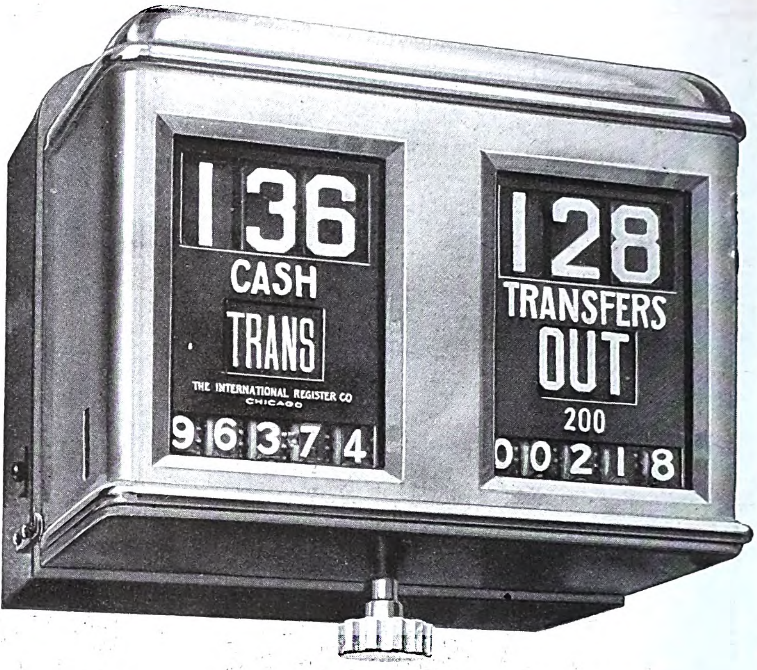
TEXACO Engineers have constantly worked right in with the roads' own operating engineers, and have placed the lubrication of every moving part in these vast transportation systems on a uniformly efficient and economical basis.

Certainly the new equipment, now being delivered to the Brooklyn City Railroad, is assured of a fine start and a long life of profitable operation with TEXACO products supplying the lubrication.

17 Battery Place, New York, N. Y.

Offices in principal cities

International Registers *in* Brooklyn



R12 electrically operated double register

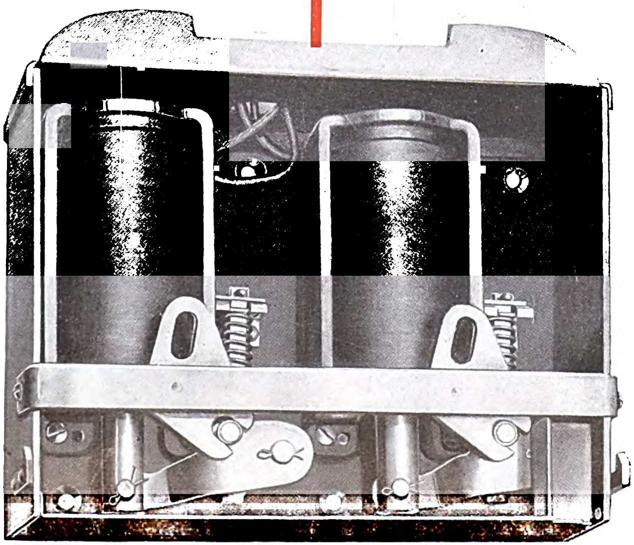
Electrically operated from fare boxes!

B12 Electric Back for double register

International registers have been used on the Brooklyn system for thirty years, their purchases having exceeded 2500.

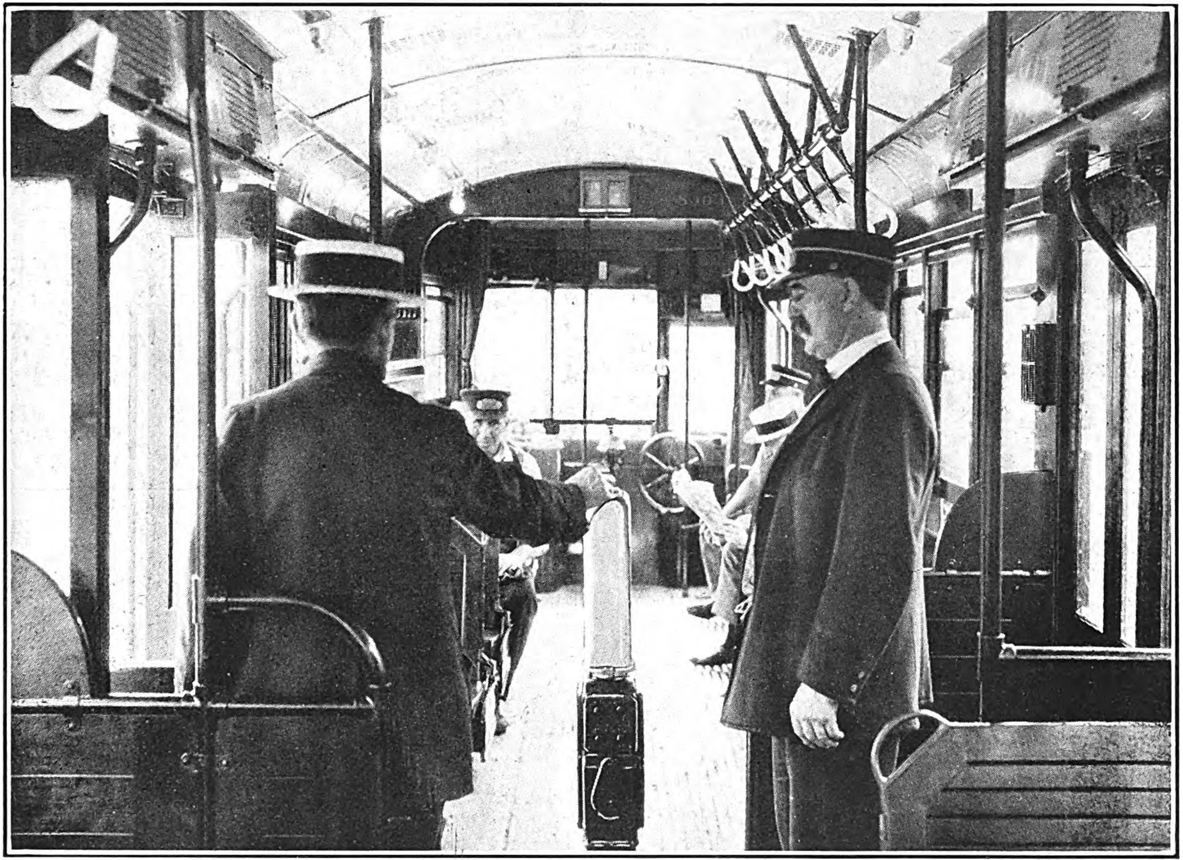
The new type Internationals, the R12 double register, electrically operated, were installed on the first 200 of this new type of car, and have given such efficient service that the remaining 335 cars are being similarly equipped. The cash side is operated by the dropping of a nickel or dime; the ticket side by a push button.

The various types of International registers today are the logical development of over thirty years of register design and construction by this company. They are practically the standard of the electric railway industry.



The International Register Co.
15 South Throop Street, Chicago, Illinois

New Riders in Brooklyn

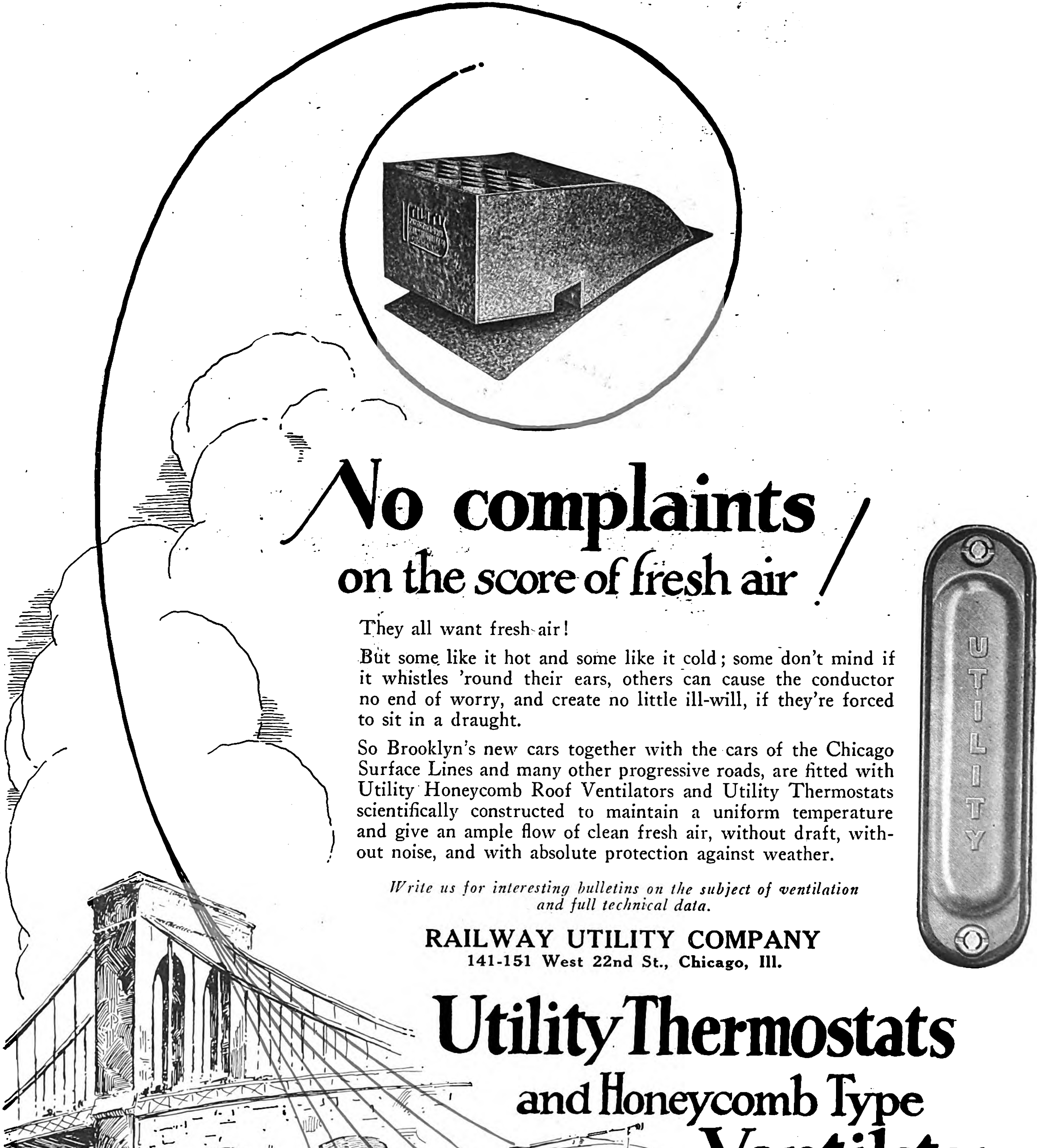


Visible, Audible, Instantaneous, Automatic Registration

THE experience in one year with the new electrical Johnson Fare Box in operation on the 200 Brooklyn cars, and the 335 now being installed on the new Brooklyn cars, proves:

1. The type "J" Electric Fare Box will reduce your present maintenance fare collection cost fifty per cent (50%).
2. It relieves the Conductor of at least 75% of the present duties he has to perform as to fare collection.
3. The "J" Box will save at least 10% of your present loading time.
4. It makes inspection for your Secret Service and Inspectors at least 25% easier and far more accurate.
5. It is impossible to estimate how many accidents this new equipment will prevent on one-man cars and buses, but it stands to reason that if an operator has no fare collection duties to perform, other than making change, he can give considerably more attention to the driving of the car and looking out for the passengers.
6. It will increase the receipts at least 4%.

Johnson Fare Box Co.
Ravenswood, Chicago, Ill.



No complaints on the score of fresh air!

They all want fresh air!

But some like it hot and some like it cold; some don't mind if it whistles 'round their ears, others can cause the conductor no end of worry, and create no little ill-will, if they're forced to sit in a draught.

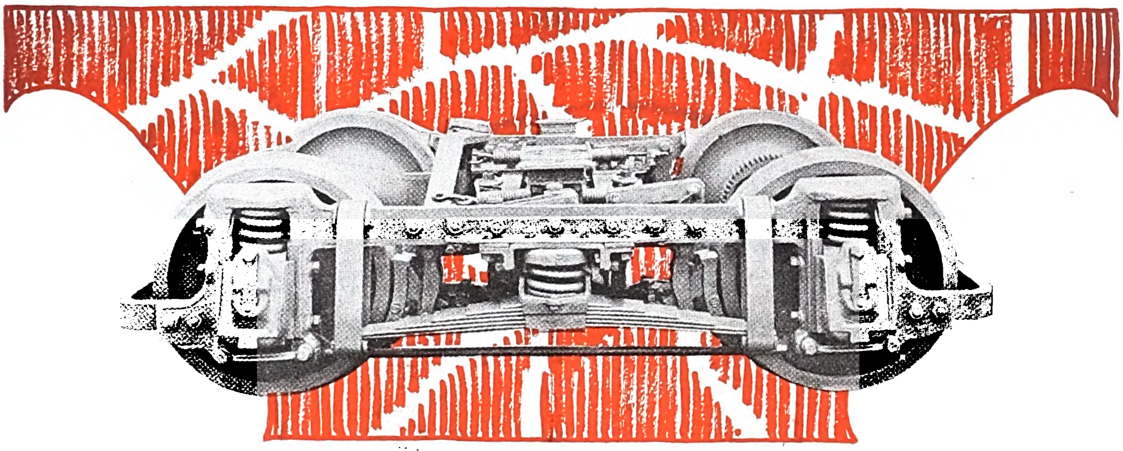
So Brooklyn's new cars together with the cars of the Chicago Surface Lines and many other progressive roads, are fitted with Utility Honeycomb Roof Ventilators and Utility Thermostats scientifically constructed to maintain a uniform temperature and give an ample flow of clean fresh air, without draft, without noise, and with absolute protection against weather.

Write us for interesting bulletins on the subject of ventilation and full technical data.

RAILWAY UTILITY COMPANY
141-151 West 22nd St., Chicago, Ill.

Utility Thermostats and Honeycomb Type Ventilators

Provides Passenger Comfort and Safety



"For the business end" of the new car

STANDARD

ROLLED STEEL WHEELS

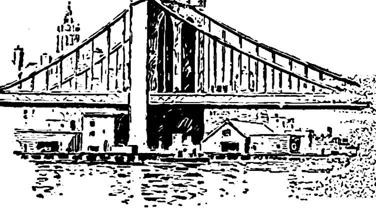
STANDARD STEEL WORKS COMPANY

Philadelphia, Pa.

BRANCH OFFICES:

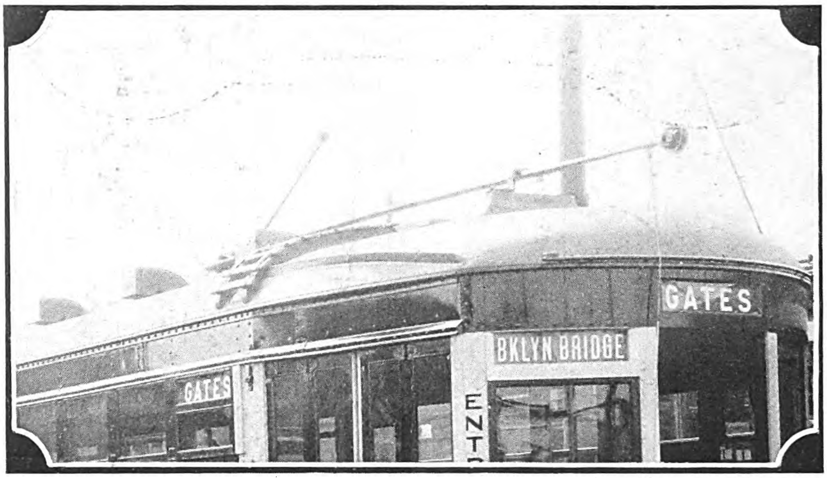
CHICAGO
ST. LOUIS
NEW YORK
HOUSTON, TEXAS
PORTLAND, ORE.
RICHMOND, VA.
SAN FRANCISCO
BOSTON
ST. PAUL, MINN.
PITTSBURGH, PA.
LOS ANGELES, CAL.
MEXICO CITY, MEX.

WORKS: BURNHAM, PA.



Attractiveness, Speed and Econom

Brooklyn comes to



For Trolley Poles and Wheels

Only the best of service-proved equipment would do for Brooklyn City's new car order. Columbia Trolley Poles and Wheels were specified because for years past they've been piling up unusually good service records all over the country—a natural result of sound practical design backed by 35 years' experience in the building of such equipment.

Columbia Trolley Poles are made in butt weld and seamless types, reinforced at the lower end to take up bending strains. Standard lengths 11 to 16 ft.

Columbia Trolley Wheels are made exclusively of virgin metal alloys developed through years of experimenting for just-right hardness for least wire wear and greatest wheel mileage.

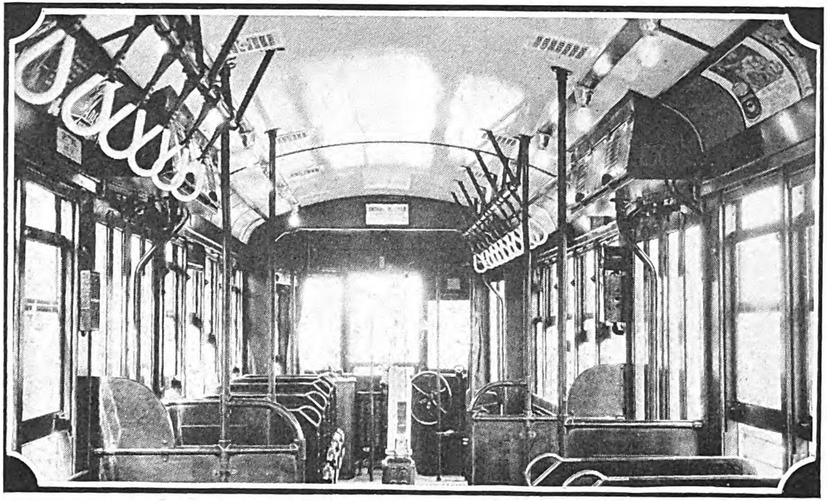
COLUMBIA

- Air Brake Handles
- Armature Bearings
- Armature Coils
- Brake Parts
- Controller Handles
- Controller Parts
- Commutators
- Door Mechanisms
- Gear Cases
- Resistance Grids
- Motor Parts
- Trolley Harps, Poles, Wheels, etc.
- Also Iron, Steel, Brass, Bronze and White Metal Castings; Drop Forgings

Columbia Machine Works &
3313 Atlantic Avenue

[illegible]r Net Revenue in Brooklyn

Columbia, Brooklyn—



For Nevasplit Headlinings

Notice the headlinings of these new Brooklyn cars—smooth, perfectly formed and flawlessly painted. Nevasplit gives this fine finish *always*, with least installation trouble and expense. What is more, Nevasplit headlinings keep their appearance year in and year out.

And there are sound reasons why! Nevasplit is wood in its highest form of refinement—a wood fiber board without knots, grain, sap or artificial stiffening. It has tremendous tensile strength, is non-inflammable, water-proof and a splendid heat and cold insulation. Its efficiency and economy has been consistently demonstrated in years of service on every type of electric railway passenger car.

COLUMBIA

- Armature Bearing Babbitting and Broaching Machines
- Armature Buggies
- Armature Lead Flattening Rolls
- Shaft and Axle Straighteners
- Babbitting Molds
- Banding and Heading Machines
- Car Hoists
- Coil Winding and Taping Machines
- Pinion Pullers
- Pit Jacks, etc., etc.

Malleable Iron Company
—Brooklyn, N.Y.

COLUMBIA MACHINE WORKS

The trolley cord Samson Spot

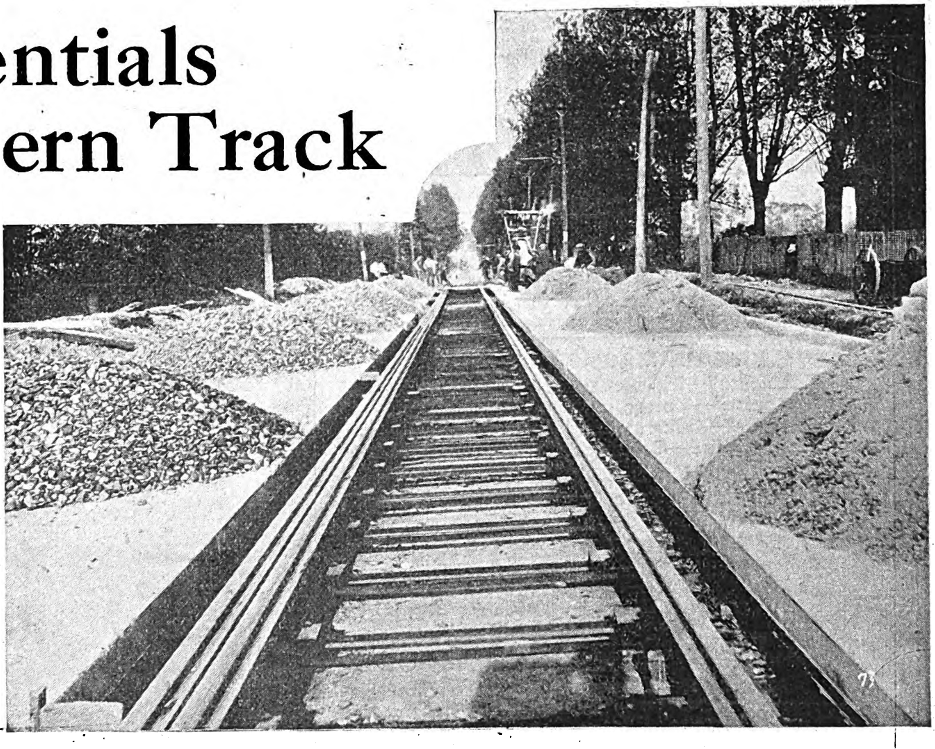
FLATBUSH
BORO HALL
ENTRANCE
8300

The consistently long life and uniform high quality of Samson Spot Trolley Cord have long been demonstrated in everyday service on Brooklyn's street cars. So it was but natural that this tough, flexible, smoothly-braided and waterproof cord should be specified for the 335 new cars on the Brooklyn City R.R.'s orders.

Write for Samples.

The Samson Cordage Works, 88 Broad St., Boston, Mass.

Prime Essentials of the Modern Track



Concrete for permanence . . . steel for strength . . . Wood blocks cushioned in asphalt for shock absorption.

Permanence, strength, resiliency—these are the **undisputed,** prime essentials of the modern track.

Judged on that basis Dayton Resilient Track scores 100!

The Dayton
Mechanical Tie Co.
707 Commercial Building
DAYTON, OHIO

DAYTON *Resilient* **TIE**

Arc Weld Rail Bonds

AND ALL OTHER TYPES

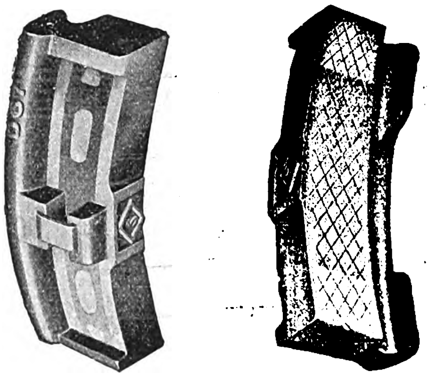
Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York
Boston
Cleveland
Pittsburgh
Denver
U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

BRAKE SHOES

AERA Standards Brake Heads



Diamond "S" Steel Back and Lug Shoes best for all equipment.

Manufactured and sold under U. S. Patent and Registered Trade Mark.

American Brake Shoe and Foundry Co.
30 Church Street, New York
332 So. Michigan Ave., Chicago

ACME WIRE

PRODUCTS

Acme engineers have studied electrical insulating materials for years. Perhaps they can solve your problem.

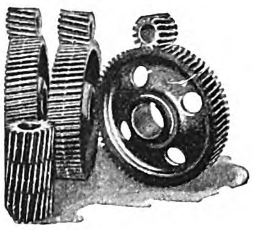
ACME MAGNET WIRE
"Enamelite"—Plain enameled copper wire
"Cottonite"—Cotton-covered "Enamelite"
"Silkenite"—Silk-covered "Enamelite"
Magnet Wire—Cotton or silk, single or double

ACME COIL WINDINGS
Field Coils, Meter Coils, Ignition Coils, Windings for Audio and Radio Frequency Transformers.

ACME VARNISHED INSULATIONS
Varnished Cambrics—
Black and yellow
Varnished Silks and Tapes—
For every requirement
Varnished Papers—
Black and yellow
Varnished Tubing—
"Spaghetti," all sizes, 5 colors
"Celatsite" Wire—
Tinned, spaghetti-covered wire for radio sets; 5 colors
Insulating Varnishes

Catalog sent Engineers and Executives

THE ACME WIRE COMPANY
Main Office and Plant, New Haven, Conn.
New York, 52 Vanderbilt Ave.; Chicago, 427 West Erie Street; Boston, 80 Federal Street; Cleveland, Guardian Bldg.;



"Tool Steel" helical gears are Quiet on the start and Continue Quiet because They dont wear.

BUY THE BEST

The Tool Steel Gear and Pinion Co.
CINCINNATI, OHIO

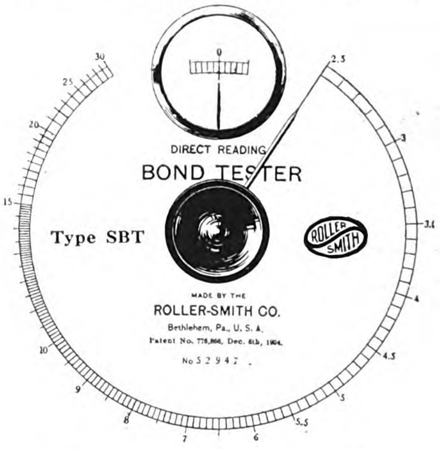
You're having brush trouble

CORRECT IT
USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron
345 Madison Avenue, New York
Pittsburgh Office: 634 Wabash Bldg.
Chicago Office: 1657 Monadnock Block
San Francisco Office: 525 Market Street
Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal and Toronto



Check up these losses!

Assuming 30 ft., 70 lb. A.S.C.E. rails and a well-known make and type of bond, the cost of bonding five miles of track is about $1,318.50.
The resistance of each bond under perfect conditions is equal to 2.51 ft. of unbroken rail.
Increase of resistance to average of 10 ft. means losses in bonds equal to about $1,698.58 *over normal loss* (assuming current at two cents per kw.h.).
The "One-Man" ROLLER-SMITH Bond Tester locates these leaks and warns you of your losses.

Send for Bulletin No. G-200 and G-201.

"An Experience of over thirty years is behind every ROLLER-SMITH product."

ROLLER-SMITH COMPANY
Electrical Measuring and Protective Apparatus

Main Office:
2128 Woolworth Bldg.,
NEW YORK

WORKS:
Bethlehem, Penna.

Offices in principal cities in U. S. A. and Canada, also in Havana, Cuba.

AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY· NEW YORK

Manufacturers of Steel Structures of all classes

particularly BRIDGES AND BUILDINGS

SALES OFFICES:

NEW YORK, N. Y.........Empire Bldg.
Philadelphia, Pa...........Widener Bldg.
Boston, Mass...........120 Franklin St.
Baltimore, Md..........Continental Bldg.
PITTSBURGH, PA..........Frick Bldg.
Cincinnati, Ohio........Union Trust Bldg.
Cleveland, Ohio.........Rockefeller Bldg.

Detroit, Mich. . . Buhl Building
CHICAGO, ILL......208 So. La Salle St.
St. Louis, Mo..Liberty Central Trust Bldg.
Denver, Colo....First National Bank Bldg.
Salt Lake City, Utah..Walker Bank Bldg.
Duluth, Minn.............Wolvin Bldg.

Minneapolis, Minn......629 2nd St., S. E.

Pacific Coast Representative:
U. S. Steel Products Co., Pacific Coast Dept.

San Francisco, Cal..........Rialto Bldg.
Portland, Ore..............Selling Bldg.
Seattle, Wash..4th Ave. So., cor Conn. St,

Export Representative: United States Steel Products Co., 30 Church Street, New York

---

Lorain Special Trackwork Girder Rails

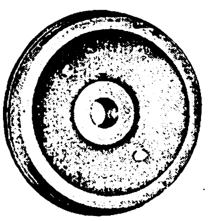
Electrically Welded Joints

THE LORAIN STEEL COMPANY
Johnstown, Pa.

Sales Offices:
Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh

Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.



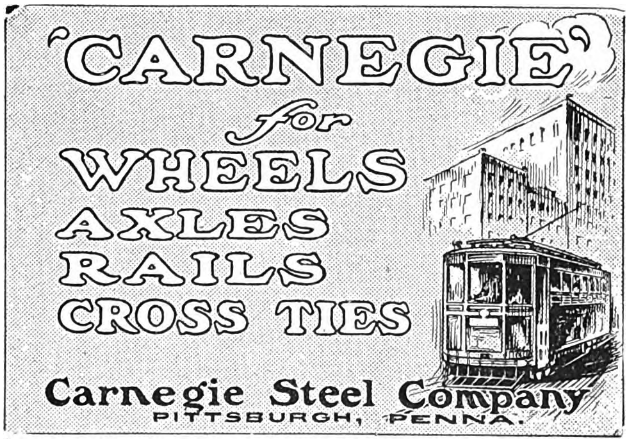
Cambria Rolled Steel Electric Car Wheels

Best for Longer Service

Other products for the electrical field includes axles, armature shafts, rails, spikes, track work, splice bars, bolts, tie plates, tie rods, pole line material, sheets, magnet steel and gear blanks.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM



CARNEGIE
for
WHEELS
AXLES
RAILS
CROSS TIES

Carnegie Steel Company
PITTSBURGH, PENNA.

BARBOUR-STOCKWELL CO.

205 Broadway Cambridgeport, Mass.
Established 1858

Manufacturers of

Special Work for Street Railways

Frogs, Crossings, Switches and Mates
Turnouts and Cross Connections
Kerwin Portable Crossovers
Balkwill Articulated Cast Manganese Crossings

ESTIMATES PROMPTLY FURNISHED

E. G. Long Company

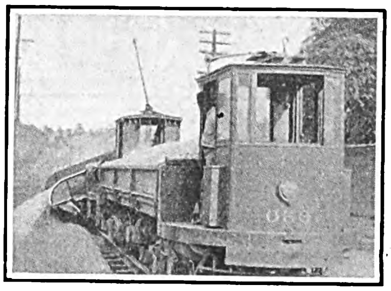
50 Church St., New York

Electric Railway Materials Peckham Truck Parts

New York Representatives:

American High Speed Chain Co.—Silent Chain Drives.
D. O. James Manufacturing Co.—Speed Reducing Transmissions.
Bound Brook Oil-Less Bearing Co.—Brass and Bronze Castings.
Ulster Foundry Corporation—Grey Iron Castings.

The DIFFERENTIAL CAR



Standard on 60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of Water Tube Boilers of continuing reliability

Makers of Steam Superheaters since 1898 and of Chain Grate Stokers since 1893

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building

WORKS
Bayonne, N. J.
Barberton, Ohio

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 521-5 Baronne Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 435 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.
Irvington, N. J.

Sales Representatives in the Principal Cities

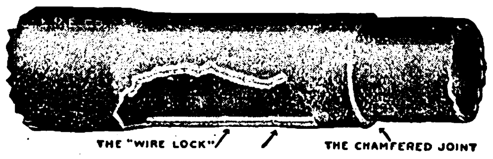
The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE KALAMAZOO
No. 8

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

ELRECO TUBULAR POLES



COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street

TULC
A
LUBRICANT

We make a specialty of
ELECTRIC RAILWAY LUBRICATION
We solicit a test of TULC on your equipment

The Universal Lubricating Co.
Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company, Straus Bldg.

B. A. HEGEMAN, Jr., President C. C. CASTLE, First Vice-President
H. A. HEGEMAN, Vice-Pres. and Treas. F. T. SARGENT, Secretary
W. C. PETERS, Manager Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York.
Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions
Bell Locked Fare Box and Change Maker
The Aluminum Field Coils
Walter Tractor Snow Plows
Cutler-Hammer Electric Heaters
Pittsburgh Forge & Iron Co.'s Products
Genesco Paint Oils
E. Z. Car Control Corporation's Safety Devices
Garland Ventilators
Flaxlinum Insulation
Yellow Coach Mfg. Co.'s Single and Double Deck Busses
Economy Electric Devices Co.'s Power Saving and Inspection Meters
Anglo-American Varnish Co., Varnishes, Enamels, etc.
Gilmer Multiple Safety Step Treads
National Hand Holds
Ft. Pitt Spring & Mfg. Co., Springs
Turnstile Car Corporation's Turnstiles
Anderson Slack Adjusters
Feasible Drop Brake Staffs
Dunham Hopper Door Device

"POSITIONS VACANT"

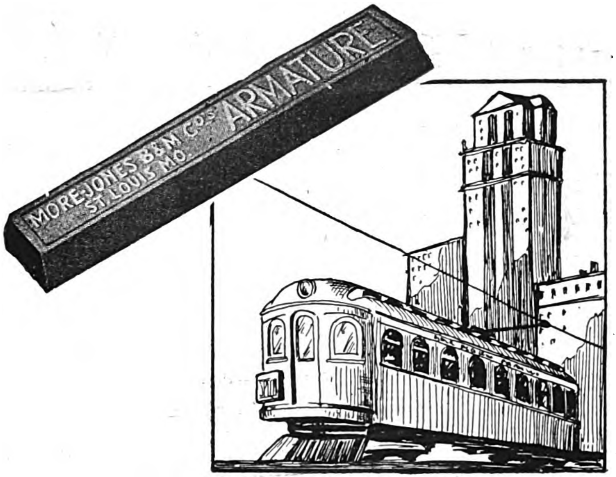
Good jobs appear under this heading in the

"SEARCHLIGHT SECTION"

EMPLOYERS! *Use* these columns for good men.

MEN! *Consult* these columns for good jobs.

8 cents a word. *Minimum $2.00 an insertion.*
0130


MORE-JONES B&M CO'S ST. LOUIS MO. ARMATURE

M-J Armature Babbitt

Contains no lead. The proper proportions of copper, tin, antimony and *nickel*—pure new metal—compounded under strict laboratory supervision results in a babbitt metal which successfully resists the strains and temperatures met in electric railway service in a most economical way. It can be used over and over again without deterioration.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES QUALITY PRODUCTS

"Ventilator Tests"

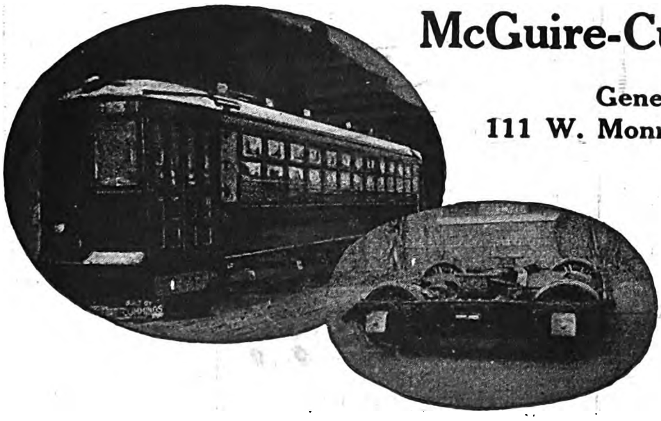
A Booklet You Need!

FREE

Know what to expect of *any* street car or bus ventilator *before you buy.* This booklet outlines a plan for testing closed-vehicle ventilators and tells how N-L Ventilators perform under test. A valuable booklet — we'll gladly send you a copy of "Ventilator Tests."

N-L

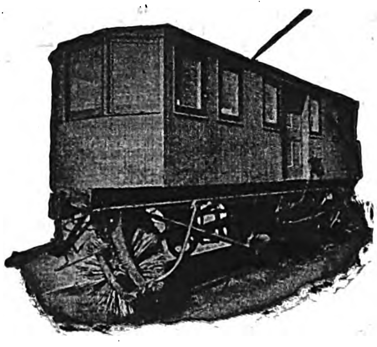
THE NICHOLS-LINTERN COMPANY
7960 Lorain Ave., Cleveland, O.
Canadian Representatives:
Railway & Power Eng. Corp., Ltd., 133 Eastern Ave., Toronto, Ont.



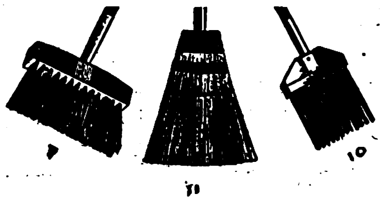
McGuire-Cummings Manufacturing Co.

General Offices:
111 W. Monroe St., Chicago, Ill.

Street Cars
Trucks
Snow Sweepers



NEW and RELAYING RAILS
1 TON OR 1000
TRACK EQUIPMENT
L.B. FOSTER CO.
PITTSBURGH-PENNSYLVANIA
RAIL ACCESSORIES
NEW YORK JERSEY CITY PHILADELPHIA HAMILTON, O.



PAXSON
Switch and Frog
BROOMS
Wire or Rattan
J. W. PAXSON CO.
Philadelphia, Pa.

PROVIDENCE FENDERS **H-B** LIFE GUARDS

The Consolidated Car Fender Co., Providence, R. I.
Wendell & MacDuffie Co., 110 E. 42nd St., New York
General Sales Agents

ALLIS-CHALMERS
MILWAUKEE, WIS. U.S.A.

Electrical Machinery, Steam Turbines, Steam Engines, Condensers, Gas and Oil Engines, Air Compressors, Air Brakes

"The Standard for Rubber Insulation"

INSULATED WIRES
and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes
Send for Handbook

The Okonite Company
The Okonite-Callender Cable Company, Inc.
Factories, PASSAIC, N. J. PATERSON, N. J.
Sales Offices:
New York Chicago Pittsburgh St. Louis
Atlanta Birmingham San Francisco
Los Angeles
F. D. Lawrence Electric Co., Cincinnati, O.
Novelty Electric Co., Phila., Pa.
Pettingell-Andrews Co., Boston, Mass.
Canadian Representatives:
Engineering Materials Limited, Montreal.

OKONITE TRADE MARK REG. U.S. PAT. OFFICE
OKONITE-CALLENDER

AUTOMATIC SIGNALS
Highway Crossing Bells
Headway Recorders
Flasher Relays
NACHOD SIGNAL COMPANY, INC.
LOUISVILLE, KENTUCKY.

STANDARD
Wires, Cables, Cable Accessories
Superior quality, economical prices
Standard Underground Cable Co.
Boston Philadelphia Pittsburgh Detroit
New York Washington Chicago St. Louis
San Francisco
TRADE MARK

AUTOMATIC
BLOCK SIGNALS
for single track and stub end protection
United States Electric Signal Co.
West Newton, Mass.
Proceed Aspect

TRADE MARK
For dependable Line Material that will give you maximum service use
ANDERSON
Send for Latest Quotations
289-305 A Street, Boston, Mass.

Chapman
Automatic Signals
Charles N. Wood Co., Boston

BRAZED Rail Bonds ARC WELD
ERICO
Portable Arc Welding Outfits
The Electric Railway Improvement Co.
Cleveland, Ohio

AMERICAN ELECTRICAL WORKS AMELECTRIC Wires and Cables PHILLIPSDALE, R.I.
Reg. U. S. Pat. Office
Incandescent Lamp Cord

AMELECTRIC PRODUCTS
BARE COPPER WIRE AND CABLE
TROLLEY WIRE
WEATHERPROOF WIRE
AND CABLE
MAGNET WIRE
UNDERGROUND CABLE
PAPER INSULATED

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.
Boston, 176 Federal; Chicago, 112 W. Adams;
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

SEVEN WORKS
RAMAPO-AJAX-ELLIOT
HILLBURN, NEW YORK
NIAGARA FALLS, N.Y.
CHICAGO, ILLINOIS
EAST ST. LOUIS, ILL.
PUEBLO, COLORADO
SUPERIOR, WISCONSIN
NIAGARA FALLS, ONT.
CANADA

Ramapo Ajax Corporation
RACOR
RAMAPO AUTOMATIC
RETURN SWITCH STANDS
FOR PASSING SIDINGS
TEE RAIL SPECIAL WORK
MANGANESE CONSTRUCTION
SALES OFFICES AT ALL WORKS
Main Office, HILLBURN, N.Y.

ROEBLING
WELDING CABLE
ELECTRICAL WIRES and CABLES
John A. Roebling's Sons Company, Trenton, N. J.

Use
Filler and Stretcher Brick
Manufactured by
The Nelsonville Brick Co.
150 E. Broad St., Columbus, Ohio

ANACONDA
TROLLEY WIRE
ANACONDA COPPER MINING COMPANY
THE AMERICAN BRASS COMPANY
Rods, Wire Cable Products
NEW YORK CHICAGO

NAUGLE POLES
WESTERN & NORTHERN CEDAR
NAUGLE POLE & TIE CO.
59 E. MADISON ST. CHICAGO ILL.
New York · Columbus · Kansas City · Spokane · Vancouver · Boston

100 New Users in the Last Nine Months
KASS SAFETY TREADS
HIGH
in efficiency and lasting qualities
LOW
in weight, initial and upkeep costs
Morton Manufacturing Co., Chicago

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches	$4.50 an inch
4 to 7 inches	4.30 an inch
8 to 14 inches	4.10 an inch

Rates for larger spaces, or yearly rates, on request.

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

E.R J.

POSITION VACANT

GENERAL foreman who is good armature winder for small electric railway shop near New York. P-823, Elec. Ry. Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

CLAIM agent available, 10 years' experience, member of bar; have good reason for making change. Prefer eastern location with small company in medium sized city. Opportunity for advancement more important than salary. PW-824, Elec. Ry. Journal, Leader-News Bldg., Cleveland, Ohio.

EXECUTIVE, city or interurban; twelve years' experience, electrical engineering, master mechanic, general superintendent. Age, 35. PW-757, Electric Railway Journal, Tenth Ave. at 36th St., New York.

GENERAL foreman, 26 years' experience in tracks and special work. PW-821, Electric Railway Journal, Tenth Ave. at 36th St., New York.

MASTER mechanic or shop superintendent, 20 years' experience street railway light and heavy interurban cars, motor buses and trucks. Small or large property. PW-825 Elec. Ry. Journal, 7 So. Dearborn St., Chicago, Ill.

MR. MANAGER: Are accidents costing too large a per cent of your gross; Are your receipts diminishing due to decreasing traffic? Is the attitude of your employees of a negative nature? Are your public relations strained? Are your pull-ins too frequent? If these conditions exist on your property I offer a proven record of 22 years' street and interurban experience wherein these conditions have been developed from the worst to the best. Willing to supervise the departments referred to combined or individually. In charge of safety and educational activities with present connections. Am capable of operating medium size property supplementing supervision with original methods pertaining to safety, salesmanship and employee relations. PW-826, Elec. Ry. Journal, 7 So. Dearborn St., Chicago, Ill.

YOUNG married man desires position as inspection barn foreman or general repair work. Nine years' experience; not afraid of hard work. PW-822, Electric Railway Journal, Tenth Ave. at 36th St., New York.

"Searchlight"
is
Quick Action
Advertising

0233

FOR SALE

MOTOR CAR

1—second hand Mudge Twin Engine Gasoline, Class E-4, car No. 10131 with Adjustable Gauge; manufactured by the Railways Specialty Company, Atchison, Kansas.

Write to

C. A. HARRIS

2101 Beaver Avenue, Pittsburgh, Pa.
Attention of Mr. Poole.

FOR SALE

Immediate Delivery

ELECTRIC SHOVEL

1—Vulcan Class F. 600 v., 1½ cu. yd. capacity.

JAMESTOWN ST. RY. CO.
Jamestown, N. Y.

FOR SALE

20—Birney Safety Cars. Brill built. Seating 32.

8—Steel Interurbans, 48 ft. long. Seating 52.

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

FOR SALE

Air Compressors

16—C P 27 and 12—D H 16

TRANSIT EQUIPMENT COMPANY
Cars Motors
501 Fifth Ave., New York

RAILS

New and Relaying

All sections with frogs, switches carried in stock. We also purchase roads for dismantling.

M. K. FRANK
Park Row Bldg., New York
Union Trust Bldg., Pittsburgh, Pa.

Relaying Rails
NEW RAILS - ACCESSORIES
Buy Guaranteed Relaying Rails and Save 30% to 50%
1 Ton or 1000
L.B.FOSTER CO.
PITTSBURGH, PA. - NEW YORK CITY
PITTSBURGH, PA. NEW YORK CITY
JERSEY CITY - PHILADELPHIA - HAMILTON, O.

SOME ONE WANTS TO BUY

the equipment or machinery that you are not using.

This may be occupying valuable space, collecting dust, rust and hard knocks, in your shops and yards.

SELL IT BEFORE DEPRECIATION SCRAPS IT

THE SEARCHLIGHT SECTION
IS HELPING OTHERS

—LET IT HELP YOU ALSO

[illegible]

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Accountant
James T. Swan Co.

Advertising, Street Car
Collier, Inc., Barron G.

Air Circuit Breakers
Roller-Smith Co.

Ammeters
Roller-Smith Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
Standard Steel Wks.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson, J. R.

Axles, Steel
Carnegie Steel Co.
Johnson, J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co., The

Bankers and Engineers
James T. Swan Co.

Barges, Steel
American Bridge Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., J. G., The
General Electric Co.
More-Jones Brass & Metal Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Stucki Co., A.

Bells and Gongs
Brill Co., The J. G.
Consolidated Car Heat. Co.
Elec. Service Supplies Co.

Bodies, Bus
Lang Body Co.

Boilers
Babcock & Wilcox Co.

Bolts, Standard, Special & Heat Treated
Horne & Ebling Corp.

Bond Testers
American Steel & Wire Co.
Roller-Smith Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Page Fence & Wire Co.
Railway Track-work Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Amer. Br. Shoe & Fdy. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.

Brakes, Brake Systems and Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brooms, Wire & Rattan
Paxson Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse E. & M. Co.

Buildings, Steel
American Bridge Co.

Buses, Motor
Brill Co., The J. G.
Mack Trucks

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Long, E. G.

Cables. (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Cars, Dump
Brill Co., J. G., The
Differential Steel Car Co.

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. &. M. Co.

Cars, Passenger, Freight, Express, etc.
Amer. Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Gas, Rail
Brill Co., J. G., The

Cars, Second Hand
Electric Equipment Co.
Transit Equipment Co.

Cars, Self-Propelled
Brill Co., J. G., The
General Electric Co.

Castings, Brass, Composition or Copper
Anderson Mfg. Co., A. & J. M.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
American Steel Foundries Co.
Bemis Car Truck Co.
Standard Steel Wks.

Castings, Malleable and Brass
Amer. Br. Shoe & Fdy. Co.
Bemis Car Truck Co.
Horne & Ebling Corp.

Castings, Steel
Horne & Ebling Corp.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Pantasote Co., Inc.

Ceilings, Plywood, Panels
Haskelite Mfg. Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit-Breakers
Anderson, A. & J. M. Mfg. Co.
General Electric Co.
Roller-Smith Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Root Spring Scraper Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Elec. Service Supplies Co.

Coils, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.
Intern'l Register Co.
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Elec'l Mfg. Co.
General Electric Co.
Horne & Ebling Corp.
Westinghouse E. & M. Co.

Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Tr. Br. Co.

Condensor Papers
Irvington Varnish & Ins. Co.

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co

Controllers or Parts
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Conveying & Hoisting Machinery
American Bridge Co.

Copper Wire
Anaconda Copper Mining Co.
Page Fence & Wire Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Steel & Wire Co.

Cord, Bell, Trolley, Register
Brill Co., The J. G.
Elec. Service Supplies Co.
Internat'l Register Co., The
Roebling's Sons Co., John A.
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries Co.
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossing, Frog & Switch
Ramapo Ajax Corp.

Crossing, Manganese
Ramapo Ajax Corp.

Crossings
Ramapo Ajax Corp.

Crossing, Track (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co.
Frank, M. K.
Harris, C. A.
Jamestown Street Railway Co.
Transit Equipment Co.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heat Co.
General Electric Co.
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.
St. Louis Car Co.

Doors & Door Fixtures
Brill Co., The J. G.
Consolidated Car Heat. Co.
General Electric Co.
Morton Mfg. Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.

Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Elec. Service Supplies Co.

Ears
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.

Electric Grinders
Railway Track-work Co.
Western Electric Co.

Electric Transmission Towers
American Bridge Co.

Electrodes, Carbon
Railway Track-work Co.

Electrodes, Steel
Railway Track-work Co.

Engineers, Consulting, Contracting and Operating
Allison & Co., J. S.
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layng Corp.
Bureau of Commercial Economics, Inc.
Byllesby Co., H. M.
Day & Zimmermann, Inc.
Drum & Co., A. L.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McD. Crawford, Norman
McClellan & Junkersfeld
Ong, Joe R.
Railway Audit & Inspection Co.
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
Swan, J. T.
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Allis-Chalmers Mfg. Co.
Westinghouse E. & M. Co.

Fare Boxes
Cleveland Fare Box Co.
Johnson Fare Box Co.
Perey Mfg. Co.
Nat'l Ry. Appliance Co.

Fare Registers
Electric Service Supplies Co.
Ohmer Fare Register Co.

Fences, Woven Wire and Fence Posts
Acme Wire Co.
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
Root Spring Scraper Co.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Floodlights
Elec. Service Supplies Co.

Forgings
Brill Co., J. G., The
Standard Steel Wks.

Frogs & Crossings, Tee Rail
Ramapo Ajax Corp.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co
Ohio Brass Co.
Westinghouse E. & M Co.

Furnaces, Electric Steel Melting
American Bridge Co.

Fuses and Fuse Boxes
Consolidated Car Heat. Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.
Johns-Manville, Inc.

Garages, Steel
Austin Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas Producers
Westinghouse E. & M. Co.

Gas-Electric Cars
General Elec. Co.
Westinghouse E. & M. Co.

Gates, Car
Brill Co.; The J. G.

Gear Blanks
Brill Co., J. G., The
Standard Steel Wks.

Gear Cases
Chillingworth Mfg. Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Generating Sets, Gas-Electric
General Electric Co.

Generators
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Girder Rails
Lorain Steel Co.

Gong (See Bells and Gongs)

Greases (See Lubricants)

Grinders & Grinding Supplies
Railway Track-work Co.

Grinders, Portable
Railway Track-work Co.

Grinders, Portable Electric
Railway Track-work Co.

Grinding Bricks and Wheels
Railway Track-work Co.

Ground Wires
Page Fence & Wire Co.

Guard Rail Clamps
Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.

Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Harps, Trolley
Elec. Service Supplies Co.
More-Jones Brass Metal Co.
Nuttall Co., R. D.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskelite Mfg. Co.
Pantasote Co., Inc.

Heaters, Car (Electric)
Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Helmets, Welding
Railway Track-work Co.

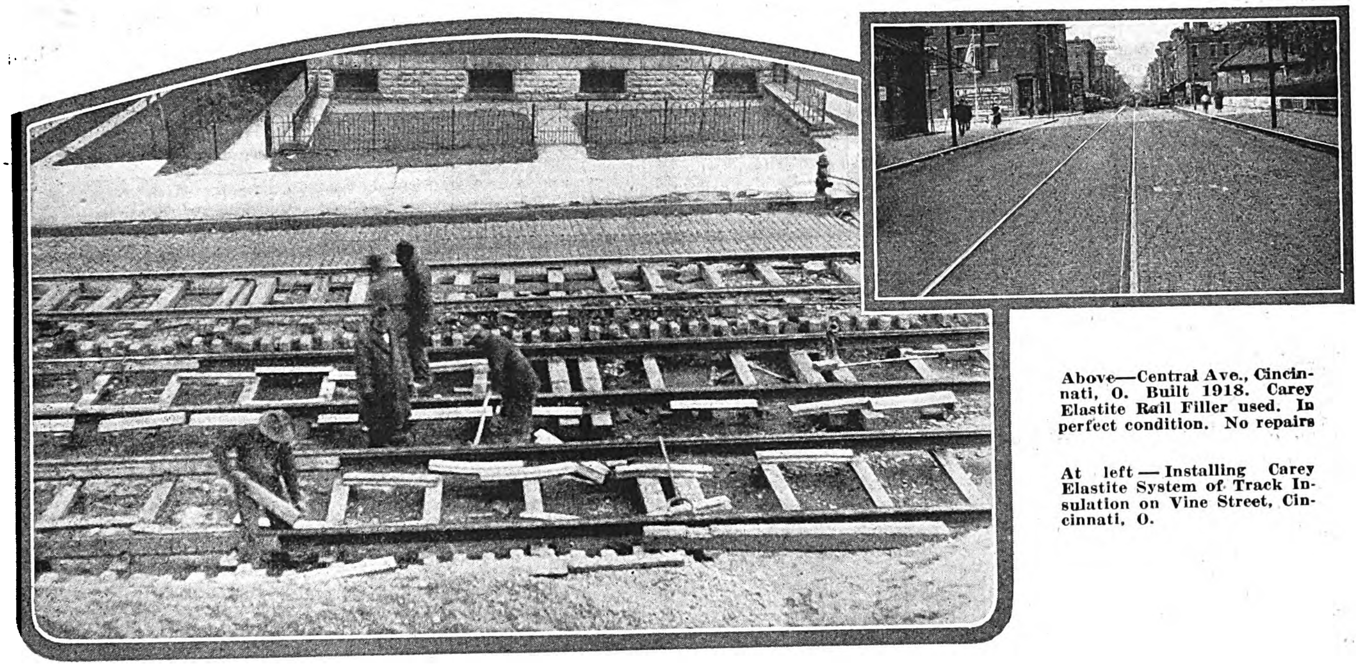
Hydraulic Machinery
Allis-Chalmers Mfg. Co.

Instruments Measuring, Testing and Recording
General Electric Co.
Roller-Smith Co.
Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Stand. Underground Cable Co.
U. S. Rubber Co.
Westinghouse E. & M. Co.

Insulating, Silk & Varnish
Irvington Varnish & Ins. Co.

Insulation (See also Paints)
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
U. S. Rubber Co.
Westinghouse E. & M. Co.



Above—Central Ave., Cincinnati, O. Built 1918. Carey Elastite Rail Filler used. In perfect condition. No repairs

At left — Installing Carey Elastite System of Track Insulation on Vine Street, Cincinnati, O.

Making Vine Street as Good as Central

Cincinnati was the proving-ground for the Carey Elastite System of Track Insulation. It was one of the very first cities to install Carey Elastite rail filler.

Years ago when Cincinnati relaid the wood block paving of Central Ave., Carey Elastite Rail Filler was used. Despite the heavy downtown traffic, not a block has been displaced by rail vibration, traffic-impact, or frost. The street is as smooth and watertight as the day it was laid.

The Carey Elastite System of Track Insulation—greatly improved since Central Avenue was built—was used in the reconstructing of other Cincinnati streets. Vine Street was made as good as Central Avenue. The street railway company will save money thru decreased maintenance costs and prolonged life of pavement.

THE PHILIP CAREY COMPANY
53 Wayne Avenue, Lockland, Cincinnati, O.

Elastite Rail Filler is Easy to Install

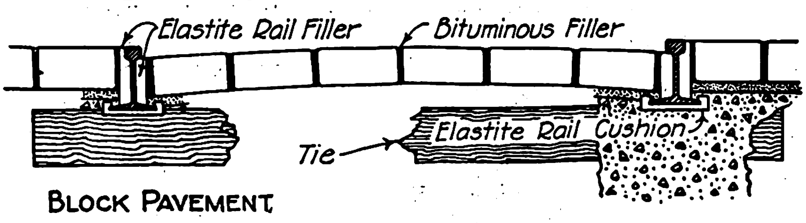
a tap of a mallet holds it in the web of the rail.

Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail vibration and traffic-noise. It is preformed to fit any rail-section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

Send for complete data and typical construction plans.

Carey Elastite

SYSTEM OF TRACK INSULATION



Insulation Slots
Irvington Varnish & Ins. Co.

Insulators (See also Line Materials)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Western Electric Co.
Westinghouse E. & M. Co.

Insulator Pins
Elec. Service Supplies Co.
Hubbard & Co.

Jacks (See also Cranes, Hoists and Lifts)
Elec. Service Supplies Co.

Joints, Rail (See Rail Joints)

Journal Boxes
Bemis Car Truck Co.
Brill Co., J. G.

Junction Boxes
Horne & Ebling Corp.
Standard Underground Cable Co.

Lamps, Guards and Fixtures
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Signal and Marker
Electric Service Supplies Co
Nichols-Lintern Co.
Ohio Brass Co.

Lanterns, Classification
Nichols-Lintern Co.

Lightning Protection
Elec. Service Sup. Co.
General Electric Co.
Ohio Brass Co.
Shaw, Henry M.
Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
Archbold-Brady Co.
Electric Ry. Equipment Co.
Elec. Service Sup. Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Locomotives, Electric
General Electric Co.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Lubricating Engineers
Texas Company
Universal Lubricating Co.

Lubricants, Oil and Grease
Texas Company
Universal Lubricating Co.

Manganese Parts
Bemis Car Truck Co.

Manganese Steel Guard Rails
Ramapo Ajax Corp.

Manganese Steel Switches, Frogs & Crossings
Ramapo Ajax Corp.

Meters (See Instruments)

Molding, Metal
Allis-Chalmers Mfg. Co.

Motor Buses (See Buses, Motor)

Motors, Electric
Allis-Chalmers Mfg. Co.
Westinghouse E. & M. Co.

Motors and Generators, Sets
Allis-Chalmers Mfg. Co.
General Electric Co.

Motormen's Seats
Brill Co., J. G.
Elec. Service Sup. Co
Heywood-Wakefield Co.
Wood Co., Chas. N.

Nuts and Bolts
Barbour Stockwell Co.
Bemis Car Truck Co.
Hubbard & Co.

Ohmmeters
Roller-Smith Co.

Oils (See Lubricants)

Omnibuses (See Buses, Motor)

Oxy-Acetylene (See Cutting Apparatus, Oxy-Acetylene)

Oxygen
International Oxygen Co.

Packing
U. S. Rubber Co.
Westinghouse E. & M. Co.

Paints and Varnishes (Insulating)
Electric Service Supplies Co
Irvington Varnish & Ins. Co.

Paints and Varnishes for Woodwork
National Ry. Appliance Co.

Paving Bricks, Filler & Stretcher
Nelsonville Brick Co.

Paving Guards, Steel
Consolidated Car Heat. Co.
W. S. Godwin Co., Inc.

Paving Material
Amer. Br. Shoe & Fdy. Co.
Nelsonville Brick Co.

Pickup, Trolley Wire
Elec. Service Supplies Co.
Ohio Brass Co.

Pinion Pullers
Elec. Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

Pinions (See Gears)

Pins, Case Hardened, Wood and Iron
Bemis Car Truck Co.
Ohio Brass Co.
Westinghouse Tr. Brake Co.

Pipe Fittings
Standard Steel Wks.
Westinghouse Tr. Brake Co.

Planers (See Machine Tools)

Plates for Tee Rail Switches
Ramapo Ajax Corp.

Pliers, Rubber Insulated
Elec. Service Sup. Co.

Pole Line Hardware
Electric Service Supplies Co.
Ohio Brass Co.

Poles, Metal Street
Elec. Ry. Equipment Co.
Hubbard & Co.

Pole Mountings
Horne & Ebling Corp.

Pole Reinforcing
Hubbard & Co.

Poles, Metal Street
Bates Expanded Steel Truss Co.

Poles & Ties Treated
Bell Lumber Co.

Poles, Ties, Posts, Piling & Lumber
Bell Lumber Co
Naugle Pole & Tie Co.

Poles, Trolley
Bell Lumber Co.
Elec. Service Supplies Co.
Nuttall Co., R. D.

Poles, Tubular Steel
Elec. Ry. Equipment Co.

Potheads
Okonite Co
Okonite-Callender Cable Co., Inc.

Power Houses
American Bridge Co.

Power Saving Devices
National Ry. Appliance Co.

Pressure Regulators
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Pumps
Allis-Chalmers Mfg. Co.

Punches, Ticket
Intern'l Register Co., The
McGill Metal Products Co.
Wood Co., Chas. N

Rail Braces & Fastenings
Ramapo Ajax Corp.

Rail Filler
Philip Carey Co.

Rail Grinders (See Grinders)

Rail Joints
Carnegie Steel Co.

Rail Joints—Welded
Lorain Steel Co.

Rail Welding
Railway Track-work Co.

Rails, Relaying
Foster Co., L. B.
Frank, M. K.
Transit Equip. Co.

Rails, Steel
Carnegie Steel Co.
Foster Co., L. B.

Railway Paving Guards, Steel
Godwin Co., Inc., W. S.

Railway Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Rattan
Brill Co., The J G.
Elec. Service Supplies Co.
McGuire-Cummings Mfg. Co.

Registers and Fittings
Brill Co., The J. G.
Elec. Service Supplies Co.
Horne & Ebling Corp.
Intern'l Register Co., The
Ohmer Fare Register Co.
Rooke Automatic Register Co.

Reinforcement, Concrete
Amer. Steel & Wire Co.

Repair Shop Appliances (See also Coil Banding and Winding Machines)
Elec. Service Supplies Co.

Repair Work (See also Coils)
General Electric Co.
Westinghouse E. & M. Co.

Replacers, Car
Elec. Service Sup. Co.

Resistances
Consolidated Car Heat. Co.

Resistance, Wire and Tube
General Electric Co.
American Steel & Wire Co.
Westinghouse E. & M. Co.

Retrievers, Trolley (See Catchers and Retrievers, Trolley)

Rheostats
General Electric Co.
Westinghouse E. & M. Co.

Roofing, Car
Pantasote Co., Inc.

Roofs
Haskelite Mfg. Co.

Rubber Specialties of all Kinds
U. S. Rubber Co.

Sanders, Track
Brill Co., The J. G.
Elec. Service Sup. Co.
Nichols-Lintern Co.
Ohio Brass Co.

Sash Fixtures, Car
Brill Co., The J. G.
Horne & Ebling Corp.

Scrapers, Track (See Cleaners and Scrapers, Track)

Screw Drivers, Rubber Insulated
Elec. Service Sup. Co.

Seats, Bus
Brill Co., The J. G.
Heywood-Wakefield Co.

Seats, Car (See also Rattan)
Brill Co. The J. G.

Seating Materials
Brill Co., J. G.
Heywood-Wakefield Co.
Pantasote Co., Inc.

Second Hand Equipment
Electric Equipment Co.
Frank, M. K.
Harris, C. A.
Jamestown Street Railway Co.
Transit Equipment Co.

Shades, Vestibule
Brill Co., The J. G.

Shovels
Brill Co., The J. G.
Hubbard & Co.

Side Bearings (See Bearings, Center and Side)

Signals, Car Starting
Consolidated Car. Heat Co.
Elec. Service Sup. Co.
Nat'l Pneumatic Co., Inc.

Signals, Indicating
Nichols-Lintern Co.

Signal Systems, Highway Crossing
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
Wood Co., Chas. N.

Signal Systems, Block
Elec. Service Sup. Co.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.

Slack Adjusters (See Brake Adjusters)

Sleet Wheels and Cutters
Anderson Mfg. Co., A. & J. M.
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.

Smokestacks, Car
Nichols-Lintern Co.

Snow-Plows, Sweepers and Brooms
Brill Co., The J. G.
Consolidated Car Fender Co.
McGuire-Cummings Mfg. Co.
Root Spring Scraper Co.

Soldering and Brazing Apparatus (See Welding Processes and Apparatus)
Irvington Varnish & Ins. Co.

Special Adhesive Papers
Irvington Varnish & Ins. Co.

Special Trackwork
Lorain Steel Co.

Spikes
Amer. Steel & Wire Co.

Splicing Compounds
U. S. Rubber Co.
Westinghouse E. & M. Co.

Splicing Sleeves (See Clamps and Connectors)

Springs, Car and Truck
American Steel Foundries Co.
Amer. Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Wks.

Sprinklers, Track and Road
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.

Steel and Steel Products
Carnegie Steel Co.

Steps, Car
Brill Co., The J. G.
Morton Mfg. Co.

Stokers, Mechanical
Babcock & Wilcox Co.
Westinghouse E. & M. Co.

Stop Signals
Nichols-Lintern Co.

Storage Batteries (See Batteries, Storage)

Strain, Insulators
Anderson, A. & J. M. Mfg. Co.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Strand
American Steel & Wire Co.
Roebling's Sons Co., J. A.

Superheaters
Babcock & Wilcox Co.

Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switches, Selector
Nichols-Lintern Co.

Switches, Tee Rail
Ramapo Ajax Corp.

Switches, Track (See Track Special Work)

Switches and Switchboards
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Synchroscopes
Roller-Smith Co.

Tampers, Tie
Railway Track-work Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Tee Rail Special Track Work
Ramapo Ajax Corp.

Telephones and Parts
Elec. Service Supplies Co.

Terminals, Cable
Std. Underground Cable Co.

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats
Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

Ticket Choppers & Destroyers
Elec. Service Supplies Co.

Ticket Punches
McGill Metal Products Co.

Ties, Mechanical
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel
Barbour-Stockwell Co.
Carnegie Steel Co.
Godwin Co., Inc., W. S.
International Steel Tie Co.

Ties, Wood Cross (See Poles, Ties, Posts, etc.)

Tools, Track & Miscellaneous
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Hubbard & Co.
Railway Track-work Co.

Torches, Acetylene (See Cutting Apparatus)

Towers and Transmission Structures
Archbold-Brady Co.
Bates Expanded Steel Truss Co.
Westinghouse E. & M. Co.

Track Grinders
Railway Track-work Co.

Trackless Trolley Cars
Brill Co., The J. G.

Track, Special Work
Barbour-Stockwell Co.
Ramapo Ajax Corp.

Transfer (See Tickets)

Transfer Issuing Machines
Ohmer Fare Register Co.

Transfer Tables
American Bridge Co.

Transformers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Transportation Publication
Blake & Jackson's Electric Railway Transportation

Treads, Safety, Stair, Car Step
Morton Mfg. Co.

Trolley Bases
General Electric Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Ohio Brass Co.

Trolley Bases, Retrieving
Nuttall Co., R. D.
Ohio Brass Co.

Trolley Buses
Brill Co., The J. G.
General Electric Co.
Westinghouse E & M. Co.

Trolley Material, Overhead
Anderson, A. & J. M. Mfg. Co.
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Trolley Shoe
Horne & Ebling Corp.

Trolley Wheel Bushings
More-Jones Brass & Metal Co.

Trolley Wheels & Harps
Electric Service Supplies Co.
More-Jones Brass & Metal Co.

Trolley Wheels (See Wheels, Trolley)

Trolley Wire
Amer. Electrical Works ..
Amer. Steel & Wire Co.
Anaconda Copper Min. Co.
Page Fence & Wire Co.
Roebling's Sons Co., J. A.

Trucks, Car
Bemis Car Truck Co.
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
Taylor Elec. Truck Co.

Tubing, Yellow & Black Flexible Varnish
Irvington Varnish & Ins. Co.

Turbines, Steam
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Turbines, Water
Allis-Chalmers Mfg. Co.

Turnstiles
Elec. Service Supplies Co.
Perey Mfg. Co., Inc.

Turntables
American Bridge Co.

Underfloor Duct Systems
Johns-Manville, Inc.

Valves
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Varnished Papers & Silks
Irvington Varnish & Ins. Co.

Ventilators, Car
Brill Co., The J. G.
Nat'l Ry. Appliance Co.
Nichols-Lintern Co.
Railway Utility Co.

Voltmeters
Roller-Smith Co.

Welded Rail Joints
Electric Railway Improvement Co.
Ohio Brass Co.

Welders, Portable Electric
Electric Railway Improvement Co.
Ohio Brass Co.
Railway Track-work Co.
Westinghouse E. & M. Co.

Welders, Rail Joint
Railway Track-work Co.

Welding & Cutting Tools
International Oxygen Co.

Welding Processes and Apparatus
Electric Railway Improvement Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Westinghouse E. & M. Co.

Welding Steel
Electric Railway Improvement Co.

Welding Wire
American Steel & Wire Co.
Page Fence & Wire Co.
Roebling's Sons Co., J. A.

Wheel Guards (See Fenders and Wheel Guards)

Wheel Presses (See Machine Tools)

Wheels, Car, Cast Iron
Bemis Car Truck Co.

Wheels, Car Steel and Steel Tire
Standard Steel Works

Wheels, Wrought Steel
Carnegie Steel Co.

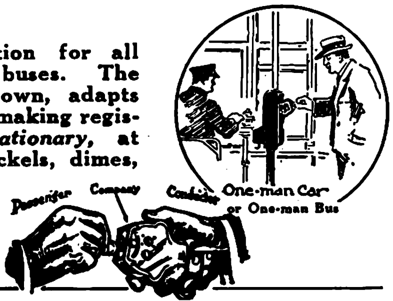
Wheels, Trolley
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works

Whistles, Air
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Wire, Copper Covered Steel
Page Fence & Wire Co.

Wire Rope
American Steel & Wire Co.
Roebling's Sons Co., J. A.

Wires and Cables
Acme Wire Co.
Amer. Electrical Works
Amer. Steel & Wire Co
Anaconda Copper Min. Co.
General Electric Co.
Okonite Co.
Okonite-Callender Cable Co., Inc.
Page Fence & Wire Co.
Roebling's Sons Co., J. A.
Std. Underground Cable Co.
Westinghouse E. & M. Co.

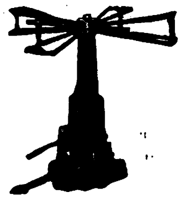


Instantaneous Registration by the Passenger

ROOKE of fare collection SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register *portable* or *stationary,* at option. Handles nickels, dimes, quarters, or metal tickets, in *any combination,* FLEXIBILITY with CERTAINTY.

Rooke Automatic Register Company Providence, R. I.



Gets Every Fare

PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

Perey Manufacturing Co., Inc.
101 Park Avenue, New York City

Over Twenty-Five Lines Having Two to Twenty Zones Collect Fares With the Aid of

CLEVELAND FARE BOXES

Let Us Explain

THE CLEVELAND FARE BOX COMPANY
CLEVELAND, OHIO
Canadian Cleveland Fare Box Co., Ltd., Preston, Ontario

PS HEATERS

Car Heating and Ventilation

are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.

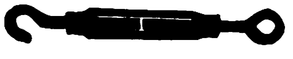
The Peter Smith Heater Company
6209 Hamilton Ave., Detroit, Mich.

HASKELITE ROOFS

Headlinings, bulkheads, sidelinings and PLYMETL girder panels should always be used where light weight and great strength are wanted.

Let us send you further information on HASKELITE and PLYMETL built cars and buses.

HASKELITE MANUFACTURING CORP.
133 W. Washington St., Chicago, Ill.



HUBBARD TURNBUCKLES

Made in three types, Eye and Eye, Eye and Hook and Eye and Clevis.

Double-Dip Hot Galvanized the Hubbard Way.

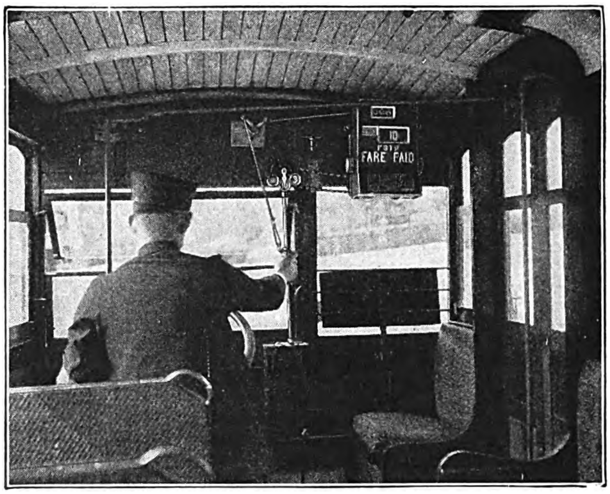
Type B, Eye and Hook

HUBBARD & COMPANY
PITTSBURGH CHICAGO

OXYGEN, ACETYLENE, HYDROGEN
for cutting welding, etc.

Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

INTERNATIONAL OXYGEN COMPANY
Main Offices: Newark, N. J.
Branch Offices: New York Pittsburgh Toledo

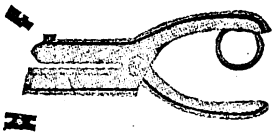


An Ohmer Fare Register Installation on a Georgia Railway and Power Company Motorbus

WHETHER you sell your transportation via motorbus or electric railway car, the Ohmer Fare Register offers the most perfect protection for the passenger, the conductor and the company.

We also manufacture the Ohmer Fare Box, the Ohmer Hub-Odometer, the Ohmer Receipt Printing Taximeter, the Atco Taximeter, the Ohmer Truck Auditor, and the Ohmer Dashodometer.

Ohmer Fare Register Company
Dayton, Ohio, U. S. A.



McGill Utility Punch

Renewable Die

1½ inch reach. Made entirely of steel. Outwears ordinary punch. Only punch made that need not be thrown away when die wears out.

McGill Metal Products Co.
128 No. Wells St., Chicago

A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command out utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we built. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut

HORNE & EBLING CORPORATION

50 CHURCH ST., NEW YORK, N. Y.

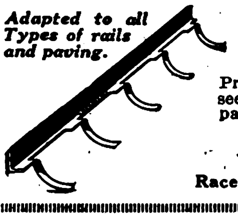
HORNE RELIANCE

Brass Hardware For Cars and Buses

Motor and Controller Parts

Sterling Trolley Bases and Brakes

Mall. Iron and Brass Castings



Adapted to all Types of rails and paving.

GODWIN
Steel Paving Guards

Proven by service to economically prevent seepage and disintegration of street railway paving.

Write for Illustrated Catalog No. 20

W. S. GODWIN CO., Inc.
Race and McComas St., Baltimore, Md.

ALPHABETICAL INDEX TO ADVERTISEMENTS

Page

A

Acme Wire Co., The.......... 54
Allis-Chalmers Mfg. Co.......... 57
Allison Co., J. E.......... 21
Amer. Brake Shoe & Fdy. Co... 53
American Brass Co., The...... 58
American Bridge Company.... 55
American Car Co........26-27, 65
American Electrical Works.... 58
American Steel Foundries 22
American Steel & Wire Co..... 53
Anaconda Copper Mining Co... 58
Anderson Mfg. Co., A. & J. M.. 58
Archbold-Brady Co........... 21
Austin Company, The......... 13

B

Babcock & Wilcox Co......... 56
Barbour-Stockwell Co. 55
Bates Expanded Steel Truss Co.. 12
Beeler Organization 20
Bell Lumber Co.............. 64
Bemis Car Truck Co.......... 21
Bethlehem Steel Co.......... 55
Blake & Jackson.............. 24
Brill Co., The J. G........26-27-65
Buchanan & Layng Corp....... 20
Business Research Corp....... 21
Byllesby Co., H. M........... 20

C

Cameron Electrical Mfg. Co.... 63
Carey Philip Co., The......... 61
Carnegie Steel Co............ 55
Chillingworth Mfg. Co........ 34
Cleveland Fare Box Co......... 63
Collier, Inc., Barron G..Front Cover
Columbia Machine Works....50-51
Consolidated Car Fender Co.... 57
Consolidated Car Heating Co.. 39
Crawford, Norman McD........ 21

D

Day & Zimmermann, Inc...... 20
Dayton Mech. Tie Co........... 53
Differential Steel Car Co., The.. 55
Drum, A. L. Co............. 20

E

Electrical Equipment Co...... 59
Electric Ry. Equipment Co.... 56
Electric Ry. Improvement Co.. 58
Electric Service Supplies Co.... 43

F

Ford, Bacon & Davis.......... 20
"For Sale" Ads.............. 59
Foster Co., Inc., L. B.......57-59
Frank, M. K................. 59

G

General Electric Co.,
16-17-18-Back Cover
Godwin Co., W. S., Inc........ 63
Gold Car Heating & Ltg. Co.... 42

H

Hale-Kilburn Co.............. 64
Harris, C. A................. 59
Haskelite Mfg. Corp.......... 63
"Help Wanted" Ads.......... 59
Hemphill & Wells 20
Holst, Englehardt W.......... 20
Horne & Ebling Corp.......... 63
Hubbard & Co............... 63

I

International Oxygen Co....... 63
International Register Co., The. 46
International Steel Tie Co., The,
Insert A-B
Irvington Varnish & Insulator
Co. 56

J

Jackson, Walter 20
Jamestown Street Railway Co.. 59
Jeandron, W. J.............. 54
Johnson & Co., Inc., J. R...... 64
Johnson Fare Box Co......... 47

K

Kelker, DeLeuw & Co......... 21
Kuhlman Car Co.........26-27-65

L

Lang Body Company, The...... 14
LeCarbone 54
Long Company, E. G.......... 55
Lorain Steel Co.............. 55

M

Mack Trucks................ 8-9
McGill Metal Products Co...... 63
McGraw-Hill Book Co., Inc.... 23
McGuire-Cummings Mfg. Co.... 57
McClellan & Junkersfeld 20
More-Jones Brass & Metal Co.. 57
Morton Mfg. Co.............. 58

N

Nachod Signal Co., Inc........ 58
National Brake Co..........19-38
National Pneumatic Co., Inc..36-37
National Ry. Appliance Co.... 56
Naugle Pole & Tie Co........ 58
Nelsonville Brick Co.......... 58
Nichols-Lintern Co. 57
Nuttall Co., R. D............ 35

O

Ohio Brass Co..............40-41
Ohmer Fare Register Co........ 63
Okonite-Callender Cable Company, Inc., The............ 58
Okonite Co., The............. 58
Ong, Joe R.................. 20

P

Page Fence & Wire Products Ass'n 21
Pantasote Co., Inc............ 11
Paxson Co., J. W............ 57
Perey Mfg. Co., Inc.......... 63
Positions Wanted and Vacant.. 59

R

Railway Audit & Inspection Co. 21
Railway Trackwork Co........ 6
Railway Utility Co............ 48
Ramapo Ajax Corp............ 58
Richey, Albert S............. 20
Roebling's Sons Co., John A... 58
Rooke Automatic Register Co.. 63
Roller-Smith Company 54
Root Spring Scraper Co...... 28

S

Saint Louis Car Co........... 29
Safety Car Devices Co........10-33
Samson Cordage Works......... 52
Sanderson & Porter 20
Searchlight Section 59
Smith Heater Co., Peter...... 63
Standard Steel Works 49
Standard Underground Cable Co. 58
Star Brass Works............. 58
Stevens & Wood, Inc.......... 21
Stone & Webster 20
Stucki Co., A................ 64
Swan, James T............... 20

T

Texas Company 44-45
Tool Steel Gear & Pinion Co... 54
Transit Equipment Co......... 59

U

United States Electric Signal Co. 58
United States Rubber Co...... 15
Universal Lubricating Co...... 56

W

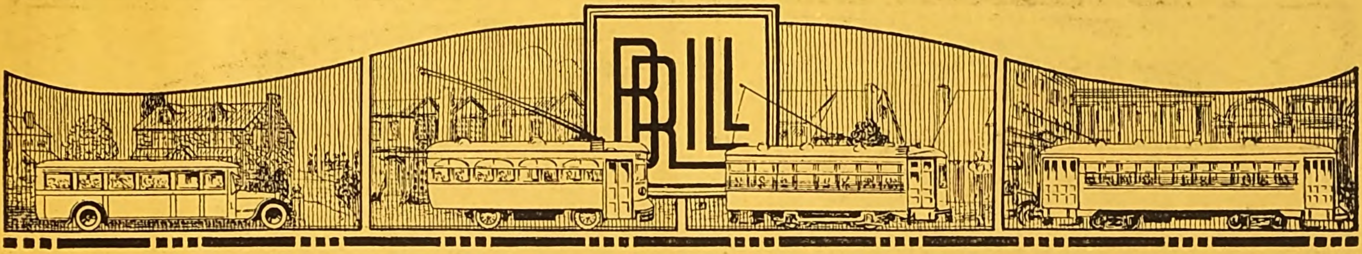
"Want" Ads 59
Wason Mfg. Co..........26-27-65
Westinghouse Elec. & Mfg. Co.,
2-4-5-30-31
Westinghouse Traction Brake Co.,
7-32
"What and Where to Buy"..60-62
White Eng. Corp., The J. G.... 20
Wish Service, The P. Edw..... 21
Wood Co., Chas. N............ 58

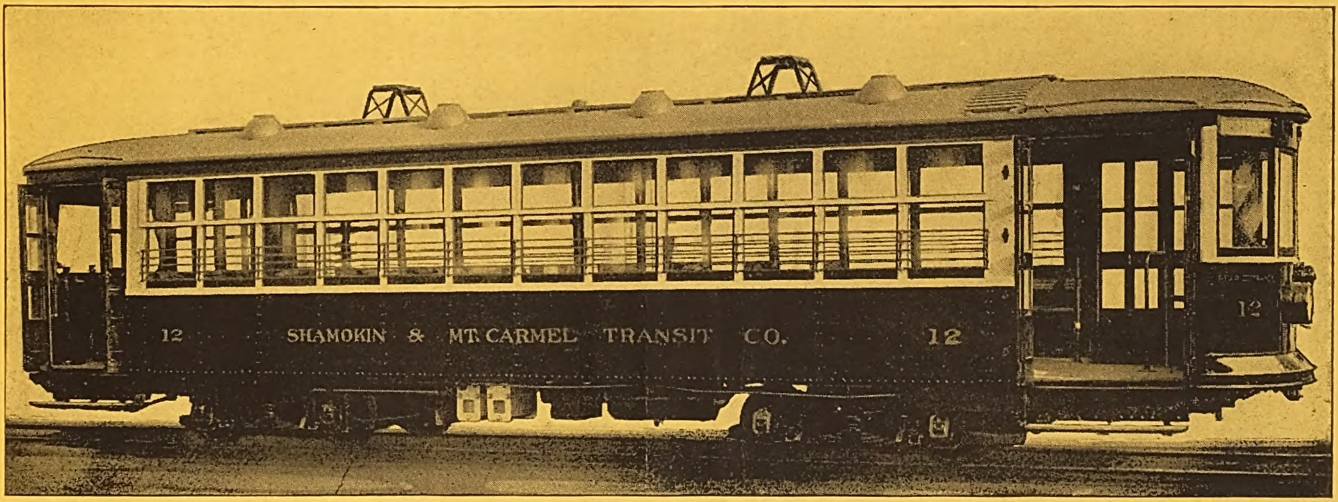
HALE-KILBURN
CAR SEATS
For Every Class of Service
General Offices and Works: Philadelphia
Offices: New York, Chicago, St. Louis, Washington, San Francisco

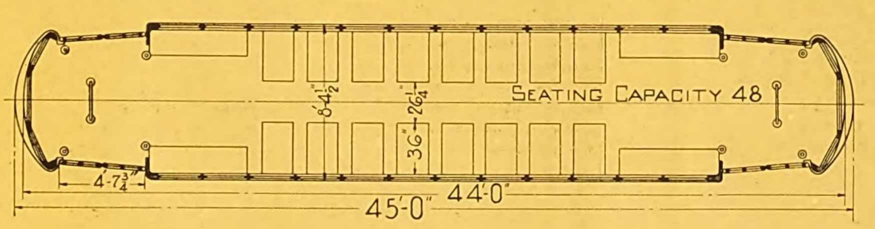
Northern CEDAR POLES Western
We guarantee
all grades of poles; also any butt-treating specifications
BELL LUMBER COMPANY
Minneapolis, Minn.

"Axle Specialists Since 1866"
Address all Mail to Post Office Box 515, Richmond, Va.
CAR AXLES
J. R. JOHNSON AND CO., INC.
FORGED STEEL AXLES
For Locomotives, Passenger, Freight and Electric Cars
Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.

STUCKI SIDE BEARINGS
A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.




12
SHAMOKIN & MT. CARMEL TRANSIT CO.
12
12


SEATING CAPACITY 48
8'-4½"
2'-6¼"
3'-6"
4'-7¾"
44'-0"
45'-0"

Brill 77-E-1 Low-level Trucks
Twin Swing Links

Shamokin & Mt. Carmel Transit Co.'s

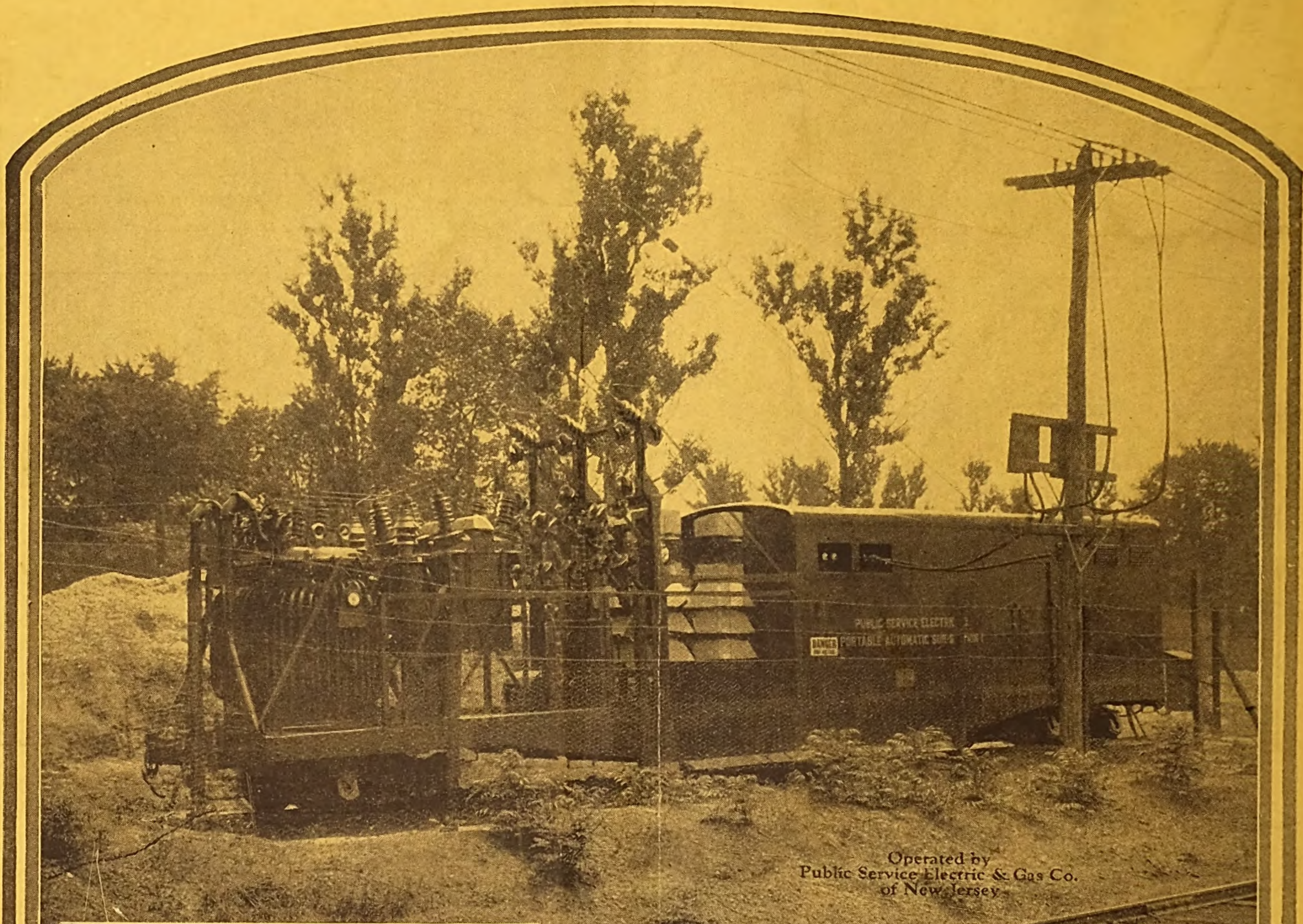
Light-Weight Double-end Cars

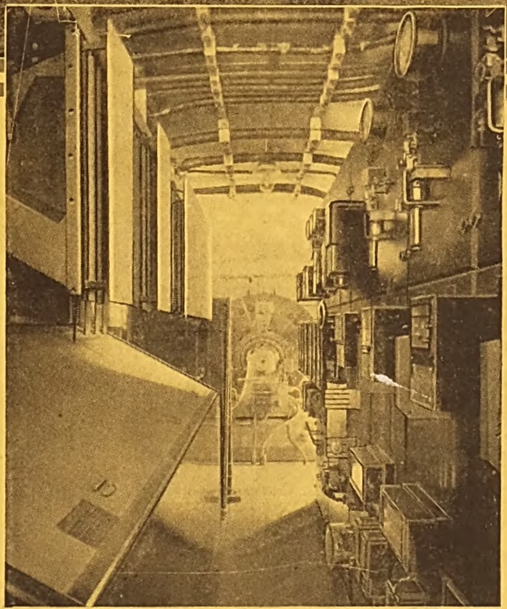
The latest equipment to be placed in service by this company on its nine-mile route between Shamokin and Mt. Carmel comprised seven modern type cars built in our Philadelphia Plant.

Under these cars the Brill No. 77-E-1 low-level type trucks are equipped with Brill Twin Swing Links which retain the smooth and steady riding action of this popular Brill truck on uneven track and under higher rates of speed.

Complete weight on trucks, and including quadruple 35 Hp. motor equipment, is 35,786 lbs.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.


Operated by
Public Service Electric & Gas Co.
of New Jersey



Portable and Automatic

—an ideal substation for emergency operation.

—ideal because it provides the economies of automatic equipment and in addition the flexibility of a portable substation for temporary use anywhere on the system.

This portable automatic substation was built and equipped, complete, by the General Electric Company.

4-4

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL LARGE CITIES

AUG 19 1925